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Import ban, agricultural sector and trade between Russian Federation and European Union

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Zákaz dovozu, agrární sektor a obchod mezi Ruskou federací a Evropskou unií

Anotace

Disertační práce se pokouší poskytnout přehled vývoje ruského zemědělského sektoru a mezinárodního obchodu s Evropskou unií (EU) a Euroasijskou hospodářskou unií (EAEU) s ohledem na zákaz dovozu zavedený v roce 2014 a určit hlavní příjemce a plátce. Vnitrostátní účinky zákazu se liší mezi kategoriemi produktů a regiony Ruska. Ceny kategorií produktů v rozsahu zákazu vykazovaly po zákazu zrychlenou dynamiku, část této dynamiky však lze připsat znehodnocení domácí měny. Peněžní převody od spotřebitelů producentům některých dotčených kategorií produktů výrazně vzrostly, což poskytlo zemědělským producentům větší podporu prostřednictvím cenových kanálů než subvencí nebo jiných druhů podpory. Z tohoto pohledu je ruská vláda málo motivována zrušit zákaz v nejbližší době. Země EAEU nezískaly výrazný prospěch ze zákazu dovozu, protože se jim nepodařilo nahradit klesající dovozní toky ze zakázaných zemí. Dopad zákazu na EU28 není rovnoměrně rozložen, přičemž nejvážnější obchodní ztráty utrpěly Německo, Nizozemsko, Litva a Polsko.

Klíčová slova: Ruská federace, Evropská unie, Eurasijská Ekonomická Unie, ekonomické sankce, zákaz dovozu, agrární sektor, agrární obchod.

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Abstract

Study attempts to provide an overview of the developments in Russian agricultural sector and international trade with European Union (EU) and Eurasian Economic Union (EAEU) considering import ban introduced in 2014, and to determine main beneficiaries and payers. Domestic effects of the ban vary between product categories and regions of Russia. Prices of product categories in scope of the ban have shown accelerated dynamics after the ban, however part of this dynamics can be attributed to the depreciation of domestic currency. Monetary transfers from consumers to producers of some of the affected product categories have significantly risen, providing agricultural producers with more support through price channel, rather than subsidies or other types of support. From this perspective, there is little incentive for Russian government to lift the ban anytime soon. Countries of EAEU have not received significant benefit from import ban, as they did not manage to substitute falling import flows from banned countries. The impact of the ban on EU28 is not uniformly distributed, with Germany, the Netherlands, Lithuania, and Poland suffering from most severe trade losses.

Keywords: Russian Federation, European Union, Eurasian Economic Union, economic sanctions, import ban, agrarian sector, agrarian trade.

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List of abbreviations

1. ANOVA – analysis of variances.
2. CEE – Central Eastern Europe.
3. CGE – computable general equilibrium.
4. CPI – consumer price index.
5. CSE – consumer support estimate.
6. EAEU – Eurasian Economic Union.
7. EFC – excess feed cost.
8. EU – European Union.
9. EV – equivalent variation.
10. FD – federal district.
11. GATT – Global Agreement on Tariffs and Trade.
12. GDP – gross domestic product.
13. GLS – generalised least squares.
14. GTAP – Global Trade Analysis Project.
15. HS – harmonized system.
16. IDF – International Dairy Federation.
17. MPS – market price support.
18. NAFTA – North American Free Trade Area.
19. OECD – Organisation for Economic Co-operation and Development.
20. OLS – ordinary least squares.
21. PPI – producer price index.
22. PSE – producer support estimate.
23. RCA – revealed comparative advantage.
24. ROA – return on assets.
25. ROCE – return on capital employed.
26. RSCA – revealed symmetric comparative advantage.
27. TPC – transfers to producers from consumers.
28. UK – United Kingdom of Great Britain and Northern Ireland.
29. USA or US – United States of America.
30. USMCA – United States – Mexico – Canada Agreement.
31. WTO – World Trade Organization.

1 Introduction

Recent years have shown that protectionism in international trade has become one of the most important topics in the international debate. International trade relations have seen the rise of protectionism in different parts of the world. The US administration began revising trade relations with China as early as 2017 leading to the imposition of tariffs on $500 billion of China's exports to the USA. Besides, tariffs were imposed on aluminium imports, which affected eighteen countries, including China, Germany, Egypt, and others. The USA initiated talks to reassess its participation in the North American Free Trade Agreement (NAFTA) with Mexico and Canada. As a result, three countries renegotiated a new deal, and the United States-Mexico-Canada Agreement (USMCA) came into effect on July 1, 2020. In essence, the new agreement aims to ease access to Canada's dairy market for US farmers, while there are stricter requirements for cars produced in Mexico to be sold on the US market free of tariffs. Agricultural trade is no exception. The whole story of the UK leaving the EU has revolved around EU's regulations on the agricultural sector and trade. Despite specific features of a political nature that surrounded Brexit from the very beginning, it has become a remarkable example of contemporary protectionist policy.

One of the main arguments for protectionism is the fact that many developed countries have seen a decrease in manufacturing jobs in recent decades, which has coincided with a global expansion of trading blocs and free trade agreements. The lifting of trade barriers has opened the way for companies to restructure supply chains and move production capacities to areas where labour costs were lower. On the other hand, export-oriented sectors like agriculture might benefit from free trade due to the broader market. However, cheaper imports might negatively affect domestic farmers. Both arguments are worth considering, but recent examples of protectionist policies have demonstrated that political considerations may prevail over economic ones. Oftentimes, protectionist movements are used to reach political goals, whatever the latter might be.

Protectionism can take several forms. One of the most common cases is raise in import tariffs, which places an additional cost on imported goods, therefore making imports *ceteris paribus* less favourable in comparison to domestically produced goods (Greenaway, 1983). Non-tariff barriers are on the other side of the spectrum. These measures refer to the regulations, which either prevent foreign goods from entering domestic market or impose additional costs on the

process of importing the goods on domestic market. Import ban can be seen as a subset of non-tariff measures or quantitative restrictions (GATT, 1994). Article XI of GATT, which is related to quantitative restrictions, directly prohibits GATT members (and as a result, member countries of WTO) from imposing any prohibitions or restrictions other than duties, taxes, or other charges on the importation of any product. There are several exceptions which might be applied (e.g. health protection or security reasons). However, even in case of exceptions, the WTO member countries applying import bans are not allowed to maintain such trade regimes indefinitely and are expected to convert them into tariffs.

There are several explanations of protectionist trade policy. First explanation uses economic downturns as a catalyst for protectionist sentiment (Takacs, 1981; Milner, 1988). In this logic, tendency to implement protectionist policies rises in the times of economic hardships, as these policies are seen by general public as a quick and effective response to promote, protect and favor domestic industries, leading into solving of existing economic issues. Second explanation of tendency to implement the protectionist policy refers to the changes among main actors in the international trade. In general terms, this approach explains the rise of protectionist sentiment with economy decline of a major player - a hegemon (Milner, 1988). These two explanations were used in application to the periods of 1920s and 1970s.

This study attempts to examine one of the recent cases of protectionism in agricultural trade, namely Russian import ban of 2014. Unlike previously mentioned cases of protectionism, Russia's import ban has not officially existed on the political agenda on both sides before it was introduced. Nevertheless, the study attempts to investigate the preconditions and derive the prerequisites that existed long before the introduction of the ban, as well as study its consequences. Another goal of the study is to identify effects of Russian import ban on Russian and European agriculture, as well as on the international trade. When discussing the effects of the ban on Russian agricultural sector, it is important to take into consideration the specifics of Russian economy. Russian agricultural sector is undergoing consolidation, and one of the features of this process are vertically and horizontally integrated agricultural corporations which rise and increase their market share (Wengle, 2021). At the same time, due to its vast territory, effects of Russian import ban should not necessarily be allocated equally across its regions. The study attempts to show the regional context of the import ban effects, including effects for agricultural producers and

consumers. The study also attempts to look into the regional trade context of Russian import ban, in order to determine the role of trading blocs in maintaining or mitigating the effects of the ban. Current study provides detailed overview of the literature on the topic of Russian import ban in order to identify gap in existing knowledge on the topic. In turn, identified knowledge gap determines objectives of the study and research questions. All in all, current study attempts to fill gaps in understanding effects of economic sanctions on the example of Russian import ban.

The study is structured as follows. Literature review section (chapter 2) aims to provide a holistic view of the current state of literature on the topic of economic sanctions and Russian import ban. Based on the literature review and identified knowledge gap, objectives and methods section (chapter 3) formulates objectives of the study and states research questions. This chapter also provides an overview of methodological tools and approaches which are relevant to economic sanctions studies, as well as describes the methodological approaches and data used in current study. Chapter 4 provides an analysis of economic developments before and after introduction of Russian import ban to set the stage for inquiring more specific questions. Chapter 5 provides a regional view on the domestic effects of Russian import ban on the example of milk market and attempts to find out whether there is an incentive for Russian Government to lift the ban soon. Chapter 6 investigates the trade dimension of Russian import ban impact and focuses on the trade competitiveness and import substitution processes, which were provoked by the ban, to determine the connections between trading bloc participation (such as EU and EAEU) and import ban effects. Chapter 7 attempts to assess the uniformity of the import ban impact on the trading partners of Russia. Chapter 8 presents synthesis of the partial study results and discusses it in comparison to existing pieces of research. Chapter 9 is the conclusion, which provides answers to the research questions and outlines possibilities for the further research on the topic.

2 Literature review

2.1 Russian import ban: general overview

Developments in Russian agriculture in 2010s are tightly connected with the topic of import ban, that was introduced by Russian Government. In August 2014 Russian Federation replied to European Union's sanctions with so-called Russian embargo which represents import ban on the several European agricultural products, including meat, fish, cheese, milk, vegetables, and fruits produced in the countries, which joined EU restrictive measures to Russia. Import ban relates to the goods originated in United States, European Union, Norway, Canada, and Australia.

Regarding domestic effects of import ban, some authors point out that the results vary across sub-sectors, with increases in production of pork and decreases among dairy, beef, and fish producers (Wengle, 2016). Liefert et al. (2019) attribute the changes in imports (average annual meat import was 40% lower in 2014-2016 compared to 2011-2013) to import ban, while changes in exports were partially caused by production-enhancing favourable weather (grain exports were 50% higher in 2014-2016 then 2011-2013). As per Boulanger et al. (2016), modelling the sanctions' situation using common general equilibrium (CGE) approach revealed that import ban should result in 5.7% decrease of milk price in Finland and 3.2% decrease of milk price in Lithuania, while price on Russian domestic market should increase by 6.1%. Authors also anticipated increases of import of dairy products from Belarus and New Zealand by 202 million EUR for each country as a result of supplier substitution. This finding is also supported by Venkuviene and Masteikiene (2015) who suggest that the dairy sector, followed by the meat sector, in Central and Eastern Europe (CEE) are the sectors most suffered from the Russian import ban. Czech Republic, Slovakia, Poland and Hungary (Visegrad Group) had experienced milk price drop and decreasing competitiveness due to Russian embargo, while elimination of milk quotas and cheap import products also played a significant role (see e.g. Zdráhal et al., 2016, Nagy & Jámbor, 2019, Zdráhal et al., 2018). Fedoseeva and Herrmann (2019) argue that even though Russian import ban has affected German exports, there are several other important events with relatively higher impact for Germany, such as EU-wide pork ban imposed by Russia in the beginning of 2014.

Banse et al. (2019) assessed several trade policy scenarios and has suggested that possible removal of Russian import ban will affect Russian agricultural production only to a limited extent, while there will be no effect on the EU. At the same time, depending on how competitive Russian farmers become, creation of free trade area from Lisbon to Vladivostok would benefit farmers in the EU more than farmers in Russia. Authors used general equilibrium model MAGNET (Woltjer et al., 2014) to estimate several trade policy scenarios for the period of 2017-2030, and the results suggest slight decrease of dairy production in Russia (-0.8% by year 2030) and increase of dairy imports by 23%. Removal of import ban would lead to 3% decrease in dairy production, which authors attribute to increased competition with high quality imports of previously banned products.

Some of the researchers also point out to the decrease in revealed comparative advantage of EU exports to Russian Federation, especially in terms of meat, milk, cheese, apples and vegetables (see e.g., Kašťaková et al., 2018). Tleubayev et al (2018) studied the changes on Russian dairy market on the example of cheese products and found evidence of increased integration of regional markets, as well as higher speed of price adjustment.

Authors that study effects of Russian import ban also point out, that growing self-sufficiency in food and seafood is the result of the ban (Wegren and Elvestad, 2018, Wegren et al., 2017). At the same time, since the establishing of the Russian Food Security Policy in 2010, average per capita food consumption improved, although the poor consume much less (Wegren et al., 2016).

Nevertheless, Loginov and Stepanyan (2019) argue that current per capita consumption of milk in Russia is below the recommended nutrition levels. Therefore, there is a significant gap to fill in order to reach food security and self-sufficiency. Djuric et al. (2015) used a regime-switching price transmission model in order to identify possible changes in the long-run equilibrium between the pig meat prices of Russia and its main non-EU trading partners. The results indicate the reduction of transaction costs in pig meat trade between Russia and its main non-EU trading partners, followed by the increase in transmission of price changes in the long run. At the same time, authors concluded that domestic consumers bear the biggest burden of import ban impact.

Russian domestic policy in terms of food security is linked to the national security of the state. In other words, country is vulnerable if it is not self-sufficient in food production. It is important to study the Russian import ban in this context. From this perspective, introduction of

Russian import ban fits into the general picture. Import ban is one of the instruments (as well as higher tariffs or non-tariff regulations) to allow domestic producers to increase production capacities and be more prepared for international competition once the ban is lifted. In essence, Russian import ban does not differ very much from the trade policies of many other countries in the world, which use similar measures to protect domestic food producers using tariffs, quality regulations or other non-tariff measures.

Russia banned the import of food and agricultural products from the EU, USA, and other countries in August 2014. The ban is regulated by the Decree of the President of the Russian Federation #560 "On the Application of Certain Special Economic Measures to Ensure the Security of the Russian Federation" (August 6, 2014) and the Decision of the Government of the Russian Federation #778 from August 7, 2014 (European Commission 2019). The Decree prohibited (or limited) the exercise of foreign economic operations with specified agricultural and food products originating from countries that imposed economic sanctions on Russia and/or Russian legal entities or individuals. The government's decision specified the list of banned products: meat, meat products, fish, milk, dairy products, fruits, and vegetables. Initially, the ban was introduced for one year, but since then, it has been prolonged every year (the most recent extension was made in November 2020). The list of products has been modified as well. In August 2014, the government excluded several categories of products, such as fry of salmon and trout, lactose-free milk, vegetables for sowing, biologically active supplements, flavour additives, food fibres, and food additives. In July 2015, juvenile (spat) oysters and mussels were excluded from the list. In May 2016, Russia allowed the import of products intended to produce baby food. In October 2017, several categories of agricultural products were added to the list. Initially, Russia banned imports from the USA, the EU, Canada, Australia, and Norway. Later, the list also included Ukraine, Albania, Montenegro, Iceland, and Liechtenstein.

The background and context of the ban are commonly connected to events in Ukraine in 2014 and Western economic sanctions that were imposed against Russia. However, there were prerequisites before 2014, and the import ban should be considered together with Russia's domestic policies in the sphere of agriculture. Russia's government had taken several steps related to food trade before 2014. The ban was introduced as a countermeasure to several packages of economic sanctions imposed on Russia since March 2014 (Council of the European Union 2014).

The first package included assets freezes and visa restrictions introduced against several high-level officials, as well as assets freeze for some entities. The list of individuals and legal entities included those who were involved in events in Crimea in 2014. Later, the list has been extended. As of September 2020, it includes 177 individuals and 48 entities. The second package of sanctions introduced by the EU in July 2014 restricted access to capital markets for major Russian state-owned banks. EU nationals and organizations were restricted from operations with Russia's new bonds, equity, or similar financial instruments with a maturity over 90 days. The third package of EU sanctions introduced a ban on the import and export of arms and related materials from/to Russia, as well as a prohibition on the export of dual-use goods and technology for military use. The fourth package included restrictive measures concerning certain energy-related equipment and technology, the export of which should be authorized by the competent authorities of member states. The USA reacted in line with restrictive measures of the EU and imposed a very similar package of restrictive measures. Personal sanctions imposed against specified individuals and entities included freeze of assets, visa bans, a ban on the export of specified technologies, and a ban on the export of dual-use technologies and military equipment (including arms). Other countries, like Norway, Australia, Switzerland, Albania, Ukraine, and Canada, later joined the pool of restrictive measures (personal and sectoral sanctions) against Russia.

At the inception of Russia's agricultural import ban, many Russian officials proclaimed the ban to be a countermeasure to personal and sectoral sanctions imposed on Russia. However, it is important to understand the context, and therefore there is a need to understand the situation in Russia before the introduction of sanctions and the agricultural import ban.

In 2010, Russia's government introduced the Doctrine of Food Security of the Russian Federation, which outlined the main directions of economic policies to ensure the food security of the country. The document set target levels of self-sufficiency in certain agricultural and food products. In 2020, these self-sufficiency targets were revised in the new doctrine, as well as targets were set for several new categories of agricultural products (Table 2.1).

Table 2.1. Food self-sufficiency targets in Russia in 2010 and 2020

Product	Doctrine 2010	Doctrine 2020
Cereals	≥ 95%	≥ 95%
Sugar	≥ 80%	≥ 90%
Sunflower oil	≥ 80%	≥ 90%
Meat and meat products	≥ 85%	≥ 85%

Milk and dairy products	≥ 90%	≥ 90%
Fish	≥ 80%	≥ 85%
Potatoes	≥ 95%	≥ 95%
Salt	≥ 85%	≥ 85%
Vegetables and melons	-	≥ 90%
Fruits and berries	-	≥ 60%
Seeds of main crops of domestic selection	-	≥ 75%

Source: author's development based on President of the Russian Federation (2010, 2020)

The 2010 Doctrine established equality between food security and food self-sufficiency, suggesting that the country is vulnerable when a significant portion of its food consumption relies on imports. The Doctrine also promoted measures aimed at increasing agricultural output in Russia, including financial support for producers, transfer of advanced technologies, and productivity gains. By 2014, the results of adopting the 2010 Doctrine had become controversial. Maslova et al. (2019) claim that self-sufficiency was achieved for cereals, sugar, sunflower oil, meat, and potatoes, while for milk, self-sufficiency amounted to 84.2%. According to Maslova et al. (2019), the food insecurity problem has remained unsolved in Russia for two major reasons. First is an unacceptably high differentiation in the consumption of staple agricultural products and food by decile population groups, depending on their income level. Second is an unjustifiably high share of imports of some basic material and technical resources necessary for the production of agricultural products and food, including seeds, purebred farm animals, compound feeds, chemical plant protection products, and equipment for agricultural production. Zhupley et al. (2018) also pointed out the dependence of crop and livestock production on imported seeds, vaccines, and bred animals. The 2020 Doctrine set higher self-sufficiency targets for sugar, sunflower oil, and fish, as well as introduced additional indicators and measures of food security, but did not significantly change approaches to establishing food security of the country that were approved in 2010.

Another important fact in understanding the context of Russia's import ban is that Russia accessed the World Trade Organization (WTO) in 2012 and was obliged to obey the rules of the organization. Article XXI of the GATT (General Agreement on Tariffs and Trade, the predecessor of the WTO) allows member countries to apply trade measures when security issues are involved (see, for example, Boklan and Bahri (2020) and Prazeres (2020)). The history of the GATT/WTO shows several cases where WTO member countries applied this article to support the introduction of restrictive measures towards trade with other member states. One of the earliest concerns related to Article XXI and its possible misuse was raised by the Negotiating Group on GATT Articles during the Uruguay Round of Multilateral Trade Negotiations (Group of Negotiations on Goods

(GATT) 1987). Since Russia introduced the agricultural import ban in retaliation to sectoral and personal sanctions, it hardly can become an issue to be settled by the WTO Dispute Settlement Body (Isachenko and Medvedkova 2019). From this perspective, the ban seems to be a logical move by Russia's authorities to use political circumstances as a chance to promote the economic policy of import substitution and protect domestic farmers. In other words, it might be seen as a chance to promote protectionism without inviting retaliation from trading partners.

Contemporary economic literature commonly considers Russia's agricultural import ban and Western sanctions against Russia in relation to each other. Dreger et al. (2016) studied the impact of Western sanctions and Russia's countersanctions (including the import ban) on the stability of Russian currency (ruble) and found that the oil price shock in 2014 had a more significant impact on currency depreciation in Russia than sanctions did. A similar result was obtained by Kholodilin and Netšunajev (2019) for the dynamics of Russia's and EU's GDPs, confirming that sanctions had an insignificant impact on both sides. Uzun and Loginova (2016) revealed that already by the end of 2014, EU countries had rerouted their agricultural export from Russia to other destinations and thus compensated for the loss of the Russian market. EU's export of meat, vegetables, and fruits increased as early as 2015, while that of milk and dairy products resumed growth in 2016. Cheptea and Gaigne (2019) estimate the embargo-induced loss of EU-28 exports at €125 million per month and the decline in consumers' welfare in Russia at 0.2-0.6%. It is not entirely unexpected that both Western sanctions and Russia's ban had an insignificant effect on GDP growth. Up to 70% of all episodes of economic sanctions do not achieve their goals (Hufbauer et al. 1990; Early 2015; Felbermayr et al. 2020).

Klomp (2020) investigated the dependency of futures contracts for agricultural commodities on news about possible and imposed sanctions by the EU and Russia and found that intensification of sanctions-related news before official announcement induced a significant decline in the return on futures for dairy products and pork. The decline in the rate of return is usually amplified after the formal announcement of sanctions. Klomp (2020) concluded that only about 10% of drops were expected by investors.

Russian scholars express various estimations of specific economic effects of the ban, but many agree that it has resulted in the growth in agricultural production in Russia. Maslova et al. (2019) pointed out that in 2013-2017, agricultural output in Russia increased by 20.3%, but in

2018, the agricultural production index declined. At the same time, Belova (2019) noticed that the ban had led to the growth in consumer prices of food, coinciding with stagnating nominal incomes. The real incomes of households have been decreasing since 2014. Growth in consumer prices was also confirmed by Bokach et al. (2016) and Parshukov et al. (2019). One of the outcomes is a declining level of consumption of banned products. This tendency was partially confirmed by Kadochnikov et al. (2019), who studied the effects of food price changes and compared consumption of staple foods in Russia in 2013-2016. It was revealed that the depreciation of the Russian ruble raised prices of imported food products and thus substantially decreased consumption. A decline in real incomes has become another factor in consumption decline. Having analyzed the structure of consumption in different income groups in 2013 and 2017, Parshukov et al. (2019) noticed a slight decrease in differences between the groups due to lower consumption in higher-income segments. There is a structural shift of consumption from higher-income segments towards lower-income ones.

Belova (2017) emphasized that amid the ban on the EU and US farmers, Belarus has substantially increased supplies of various categories of food and agricultural products to Russia, such as beef, poultry, apples, and pears. The re-export of banned products is noted by many authors. For instance, Romashkin et al. (2020) point out that Belarus increased imports from the EU by 72.3% in 2014. This may indicate re-exports of European agricultural products to Russia, as well as deliveries of Belarusian food products processed from raw materials of EU origin. Liefert and Liefert (2015) also noted that Belarusian foods produced from European raw materials were allowed on the Russian market. However, there have been disputes about the acceptable level (or degree) of processing, and Russia's authorities blocked the import of some suspected products from Belarus, such as meat and dairy.

2.2 Regional and industrial dimension of import ban effect

Most of the studies focused on Russian import ban use rather broad view on the developments in Russian economy and agriculture as a result of the ban. As it is evident based on the review of literature, there is little attention given to the topic of regional differences of import ban effect within the country. For Russia, which has vast and heterogeneous geographic and significant variation in economic development of regions, regional dimension of import ban effect still remains an area of further investigation. The same hold true for specific industries. Little attention has been given to the impact on milk and meat industry in the existing literature.

One of the categories mostly impacted by Russian import ban is milk and dairy products. Milk and dairy industry occupy a very special position in the agriculture. According to Douphrate et al. (2013), the major world's producers of milk are the European Union (about 25% share of the world dairy trade) and the United States (around 15%). International Dairy Federation (IDF, 2020) reports that the per capita milk consumption in the world increased from 102 to 110 kg from 2005 to 2014. The countries with the highest per capita consumption of liquid milk (above 90 kg) are Australia, Finland, and Sweden, while the United States, Canada, and Brazil yield between 60 and 90 kg per head, and European Union and Russia, yielding from 30 to 60 kg in per capita consumption.

Trends in milk and dairy industry of Russian Federation significantly changed in the decade of 2010-2020. According to Semenova & Shumeiko (2019) several important features of milk production and consumption emerged, especially the lag between production and demand, reduction in the number of livestock paired with increasing productivity, increased competition with foreign manufacturers engaged in milk production in Russia. Guziy (2016) also mentions the long investment cycles and low profitability level of dairy industry, as well as decreasing purchasing power of population. Growth of labour productivity has been also confirmed by Kharcheva et al. (2016), who note that equilibrium level of salaries and productivity in Russian dairy industry has not been reached yet and salary does not fully stimulate increase in labour productivity. Competition with foreign producers which invest in production facilities in Russia, has increased due to depreciation of rouble and therefore stronger position of foreign investors (Surovtsev et al., 2014). At the same time, Chinarov (2019) points out that Russian domestic producers in 2016 had lower prices than farmers from Western Europe (39-43%) and Canada

(53%). Nevertheless, there is an evidence of declining profitability of milk industry due to growth of costs outpacing growth of sale price of milk. He also revealed a shortage of domestic dairy products in the retail market to meet the paid demand and therefore suggests the introduction of state regulation in setting purchasing, wholesale, and retail prices for dairy products, insisting on stronger regulation and support for diary market. Interestingly, there is an evidence of relatively low price competitiveness of Russian agricultural producers due to real appreciation of the Russian rouble (a Russian currency denoted as RUB with a current exchange rate being slightly above 70 roubles for 1 euro (denoted as €)) as a result of difference in inflation rates in Russia and its main trade partners (Maitah et al., 2016). Looking on the problem from supply side, Petrick and Götz (2019) demonstrated that current practices of subsidizing Russian agricultural enterprises have little influence to create herd growth. Authors also showed that controlling for herd size and other farm characteristics, individual farms received up to 18% higher subsidy amounts than enterprises, and subsidies seem to be more effective for individual farms in creating herd growth. However, absolute herd growth regressions suggest that the current subsidy policy does little to add cows.

Špička and Kontsevaya (2016) identified several differences of milk processors in Russian Federation and Central European countries in the period before Russian import ban. Russian companies show three times higher profitability (measured by return on assets, ROA, and return on capital employed, ROCE), two times lower stock turnover and credit period shorter by 4 days. The authors suggested that the difference in profitability is primarily caused by higher inflation in Russia and capital structure of the enterprises.

Kharin (2015) described an important feature of vertical price transmission on Russian diary market. On the example of Voronezh Oblast, author has found that during the period of 2002-2014 retail prices seemed to had influence on farm gate prices, while the opposite influence was rejected after testing. In the following paper on the matter of price transmission on the Russian dairy market, Kharin (2019) has investigated spatial (horizontal) price transmission in four Russian Federal Districts (Central Federal District, Volga Federal District, Northwestern Federal District and Southern Federal District) using Hansen-Seo technique to identify threshold effects in cointegration relationships of price pairs. It helped to reveal long-run relationship via threshold vector error correction model (TVECM) for all the price pairs in scope of the research. He also

mentions the differences in results stemmed from linear and threshold VECM analysis, highlighting that linear VECM showed rather low degree of price pairs integration.

2.3 Import ban, trade competitiveness and trade integration

Many countries on the post-soviet territory can still be considered as developing. After three decades from dissolution of Soviet Union, their economies are still challenged with unstable economic growth, internal and external shocks and emerging trade, both inside this territory and externally. Eurasian Economic Union (EAEU) is one of the latest organizations in the region focused on promoting free trade between its members (Russia, Belarus, Kazakhstan, Armenia, Kyrgyz Republic). Despite its relative novelty (since 2012), it is already possible to assess interim results of cooperation to define the prospects of this trade bloc. One of the significant events, which should have impact on EAEU trade, was Russian import ban, which was introduced in 2014 and prohibited food and agricultural products to be imported to Russia from EU member states, USA, Australia, Norway and Canada. Effects of Russian import ban have been described in the literature (Liefert et al., 2019; Boulanger et al., 2016; Banse et al., 2019), however these works are mostly focused on impact on EU countries and effects on domestic market of Russia. Effects on neighbouring countries, including EAEU countries, have received significantly less attention.

Interconnections between trade competitiveness (and in turn trade specialization) and other economic indicators are at centre of several pieces of contemporary economic literature. Positive effect of trade specialization on poverty reduction in developing countries has been noted by Santos-Paulino (2017). Author specifically highlights, that agricultural exports have significant positive effect on poverty reduction in low-income countries. On the other side, Shahzadi & Yaseen (2019) shows, that over the last two decades, low-income countries have been under-specialized in technological products, but specialized in agricultural and food trade. This brings authors to the conclusion about necessity of policy measures to promote development of technological production in low-income countries. At the same time, Timmer et al. (2019) argue that functional specialization has been gaining more importance to economic growth, then trade specialization. According to this logic, parties in contemporary trade relations do not trade goods, but they oftentimes trade tasks. De Benedictis et al. (2009) showed the evidence, that despite broad consensus among economists about the fact, that countries tend to specialize in specific sectors, countries in fact diversify; moreover, sectoral export diversification increases with income.

Trade competitiveness is usually assessed by means of revealed comparative advantage indexes, such as Balassa's RCA (Balassa, 1965) and RSCA, Lafay index (Lafay, 1992), and

recently the cross-country specialization index B* (Amador et al., 2011). All indexes have strong and weak properties, which has been discussed in the literature to date (see, for example, Amador et al., 2011), however to the best of the knowledge, Lafay index is one of the most widely used.

International trade in Eurasian region is dynamically evolving in recent years, staying at the same time under the significant influence from political developments. Eurasian Economic Union (EAEU) is one of the latest trade blocs which was formed between the countries of former Soviet Union. The positive impact of trade unions on international trade activity has been confirmed by many authors (Seyoum and Ramirez, 2012; Hart et.al., 2015). The most significant effect is achieved for countries with small economies and large share of domestic trade. For example, Belarus and Kazakhstan as part of the EAEU have great growth potential in agriculture and the food industry (Vakulchuk & Knobel, 2018). Sanctions can be a foreign policy tool (Evenett, 2002) or can be used as a method of protecting the domestic market and supporting its own manufacturers (Smutka et al., 2016). Sanctions affect trade flows in different ways. The imposition of sanctions reduces trade flows, not only for products which are subject to sanctions, but also for those that are freely available (Galbert, 2015). On the contrary, the threat of sanctions stimulates increases of trade flows in order to accumulate reserves (Afesorgbor, 2019). Dong Yan and Li Chunding (2018) in their article argue that due to the sanctions imposed by the EU and the US on Russia in 2014 all participating countries suffer, but Russia suffers more than the US and the EU. The imposed countersanctions of Russia have an impact more on the EU than on the United States. At the same time, there are favourable effects in specific product groups for domestic manufacturers in Russia (Krivko et al., 2019), and there might be little incentive for Russian Government to lift the ban anytime soon, as it effectively substitutes agricultural support for domestic producers (Krivko & Smutka, 2020).

An important addition to the discussion of Russian import ban effect was made by Bělín and Hanousek (2021). Authors compared two cases of economic sanctions, namely Western export restrictions for oil extraction equipment and military equipment to Russia and Russian import ban. Using differences-in-differences approach, authors have found that Western sanctions on oil extraction equipment did not have effect on trade inflows into Russian Federation, while Russian import ban had resulted in an 8 times greater loss of trade. Authors attribute the difference in magnitude of the sanctions' effect to the design of the restrictive measures. While Western

economic sanctions allowed the goods to be delivered under contracts signed before the sanctions were imposed, Russian retaliatory measures did not have such provision.

3 Objectives and methods

3.1 Knowledge gap, objectives, and research questions

Literature review has shown that Russian import ban has been a topic of economic research since its introduction in the year 2014 and still attract attention of scholars. However, it is possible to identify several areas of knowledge where understanding of the Russian import ban still has gaps. Most of the existing works on the topic of Russian import ban looks at the effects of the ban on aggregated level. Existing works considers the parties of the ban as homogeneous players, and therefore considers the effect of the ban to be equally distributed among sub-parts, such as individual members countries of EU or regions of Russia. While this approach provides a bigger picture, it does not capture important partial effects of the ban. The aim of current study is to complement the economic literature and ongoing academic discussion with investigation of ban impact on lower (and more detailed) level in two main dimensions: domestic (within Russian economy) and external (EU).

At the same time, existing literature on the topic of Russian import ban does not put much attention on the interconnections between import ban policy and participation in trade blocs and organisations, such as EAEU. Clearly, there is a need to conduct deeper investigation of whether EAEU participation has any effect on trade for involved countries under Russian import ban. Current study attempts, among other objectives, to add to the ongoing discussion about this aspect.

Based on the literature review, there are still missing parts in the import ban puzzle, mainly in the area of structure and distribution of import ban impact. These missing parts of the puzzle represent two main types of effects: internal and external. Current study attempts to fill in these gaps in knowledge. All in all, the goal of this study is to investigate the circumstances and effects of Russian import ban and to provide insights into the following, albeit rather broad question: who are the winners and who are the losers in Russia's agricultural import ban?

Based on the identified knowledge gap, research questions of the study can be formulated as follows:

1. What are the main impacts of Russian import ban on agricultural sector and international trade of Russian Federation?

2. What is the extent of Russian import ban cost or benefit for the domestic producers and consumers, if any?
3. What parties (on domestic and international level) can be considered as main beneficiaries and payers of Russian import ban?
4. Is the trade effect of Russian import ban uniformly distributed among main affected parties (namely, European Union)?

Research questions are formulated rather broad due to the breadth and multidimensionality of the topic. At the same time, data limitations influence the formulation of the research questions too. In this formulation, questions attempt to provide a several perspectives on the topic of Russian import ban in particular and economic sanctions in general.

3.2 Methodological approaches

Studies on international trade, effects of economic sanctions and agricultural economics employ wide range of research methods. Breadth of methodological approaches in such studies is mainly determined by complexity of the topics and limitations of available data. Some of the most widely used approaches are difference in differences approach, time series analysis, gravity model estimation. Every method has its advantages and disadvantages, helps to achieve specific goals and objectives, and often helps to answer very specific research questions, which can be very difficult (if at all) to answer by other methods. This chapter covers methodological aspects relevant to the objectives of the study. This chapter also describes the data used in the further chapters.

Gravity model of international trade was firstly introduced by Walter Isard (Isard, 1956). The model attempts to describe the trade flows between two countries as follows:

$$F_{ij} = G * M_i * \frac{M_j}{D_{ij}} \tag{3.1}$$

where F_{ij} - trade flow; G – constant; M_i , M_j - economic dimensions of the countries i and j ; D – distance between countries.

For the purposes of the econometric estimations, the model can also be transformed to contain the error term μ_{ij}:

$$F_{ij} = G \frac{M_i \ M_j}{D_{ij}} \mu_{ij} \tag{3.2}$$

Gravity model of international trade has been used in current economic literature to study the effects of trade connections between countries, migration, common colonial past, languages etc. These models have received their name due to the fact, that their specification shares the same principles as Newton's law of gravity in physics. Several researchers pointed out, that despite the empirical positive features of the model, it does possess lack of theoretical foundation, as it was simply an analogy of physical interaction of two bodies applied to economic theories.

Using a gravity model to study international trade has a long history. Firstly, it was suggested by Jan Tinbergen (1962). Major contribution to the development and application of gravity models has been done, among others by Helpman and Krugman (1985). The model was

then significantly improved by Anderson and Wincoop (2003). The gravity model can cover the entire trade as a whole but can also examine only certain types of products. Koo et al. (1994) in his article examines the influence of factors on the meat trade. The author uses gravity model to assess the impact of tariff and non-tariff barriers using cross-sectional and time-series data analysis. Dascal (2002), using the methodology developed by Koo et al. (1994), investigated the factors influencing the export of wine - GDP per capita, distance EU membership, exchange rate and wine production index. A common methodological problem of gravity models are unobservable effects. There are individual factors that have a significant impact on the resulting variable, but these factors might be omitted from the model. Thus, these unobservable factors make significant influence on the results of the model. A possible solution to this problem is using OLS panel model with fixed effects or OLS panel model with random effects with generalized least squares method (GLS) (Lee, 2007). Fixed effects and GLS eliminates the problem of autocorrelation and heteroscedasticity, however this type of regression model does not account for the individual effects inherent in each country.

In terms of current study, gravity models' framework is used to address the first (what are the main impacts of Russian import ban on agricultural sector and international trade of Russian Federation) and third (what parties on domestic and international level can be considered as main beneficiaries and payers of Russian import ban) research questions. Gravity model has been chosen based on the fit for purpose consideration, as well as due to the fact that it can help to capture the effects of control variables. For the purposes of current research, analysis is done by employing gravity model in classic specification advanced by control variables for import ban, participation in EAEU, common border, common language, common history, and presence of seaport. Specification of the model is as follows:

$$\begin{aligned} lny_{it}^{j} = \beta_0 \; &+ \beta_1 \; lnx_1 \; + \beta_2 \; lnx_2^{j} + \beta_3 \; lnx_3^{j} + \beta_4 \; BAN_i^{j} + \beta_5 \; EAEU^{j} \\ &+ \beta_6 \; BORD^{j} \; + \beta_7 \; LANG^{j} \; + \beta_8 \; HIST^{j} + \beta_9 \; PORT^{j} \; + \gamma_j \\ &+ \varepsilon_t \end{aligned} \tag{3.3}$$

Where y_{it}^{j} - export of product i from country j to Russia; x_1 – GDP of Russia in year t; x_2^{j} – GDP of country j in year t; x_3^{j} – distance between capital of country j and capital of Russia; BAN_i^{j} – dummy variable for presence of product i from country j in the Russian import ban list;

$EAEU^j$ – dummy variable denoting whether country j is EAEU member; $BORD^j$ – dummy variable for common border with Russia; $LANG^j$ – dummy variable for common language; $HIST^j$ – dummy variable for common history; $PORT^j$ – dummy variable for presence of sea port; β_0 , β_1 - regression coefficients; γ_j - random effects; ε_t - error term.

Hausman test is used to determine whether fixed effects or random effects model is more suitable. Gravity model is estimated as fixed effects and random effects model for each of product groups. Estimation is done by employing OLS and GLS methods as appropriate. Based on the results of Hausman test, random effects model has been chosen as most appropriate for most of the product groups.

Many studies of trade sanctions use index analysis to assess changes in trade competitiveness of countries. Trade competitiveness is assessed by calculating Lafay indexes for each product group (Lafay, 1992) in the following form:

$$LFI_j^i = 100\left(\frac{x_j^i - m_j^i}{x_j^i + m_j^i} - \frac{\sum_{j=1}^{N}(x_j^i - m_j^i)}{\sum_{j=1}^{N}(x_j^i + m_j^i)}\right)\frac{x_j^i + m_j^i}{\sum_{j=1}^{N}(x_j^i + m_j^i)} \quad (3.4)$$

where x_j^i – export of product j of country i; m_j^i – import of product j of country i; N – number of items.

Another widely used index is Balassa (RCA – revealed comparative advantage) index (Balassa, 1965 and Balassa, 1989). In general terms, Balassa index measures export shares normalized on the exports of the same industry in the group of reference countries. It can be calculated as follows:

$$BI_j^A = \frac{X_j^A / X^A}{X_j^{ref} / X^{ref}} \quad (3.5)$$

Where X_j^A – country A's export values of industry j; X_j^{ref} – industry j export value for the group of reference countries.

Country is meant to have comparative advantage in industry j if the Balassa index exceeds 1, due to prevalence of this industry in country's exports.

Indexes are usually calculated for each product group in scope of research. Changes in trade competitiveness is assessed by estimating series of cross-sectional panel data regressions

(beginning and end of period) of Lafay index distributions for the period of 2000-2019 in the following specification (as discussed in Pavitt,1989; Cantwell, 1989; European Central Bank 2003; Sanidas & Shin, 2010):

$$LFI_{ij}^{END} = \alpha_i + \beta_i LFI_{ij}^{START} + \varepsilon_{ij} \quad (3.6)$$

where: LFI_{ij}^{END} – distribution of Lafay index for country i and commodities j in the end of reference period; LFI_{ij}^{START} – distribution of Lafay index for country i and commodities j in the start of reference period; α_i and β_i - standard linear regression coefficients; ε_{ij} – residual term.

Under this specification, regression coefficients show change in trade competitiveness across different product groups as assessed by Lafay index. As was discussed by Sanidas & Shin (2010), coefficient β_i describes the change in trade specialization of country towards trade partner. When the specialization pattern has not changed between two points of time, coefficient is expected to be equal to 1. Therefore, value of β_i higher than 1 shows increased specialization in sectors where the country had a competitive advantage already. Value between 0 and 1 denotes regression towards the mean, which is the situation where sectors with comparative disadvantage improves its position, while sectors with comparative advantage worsen their positions (Sanidas & Shin, 2010). Regression method used in the analysis compares two cross-sections at two points of time, and there is no dynamic time component included. However, this method allows to build series of coefficients and analyse changes during specified period of time.

For the purposed of current study, analysis of trade competitiveness helps to address the questions of main impacts of import ban on international trade, as well as what parties can be considered as main beneficiaries and payers of Russian import ban (research question 1 and 3). Trade competitiveness has been selected as a proxy for import ban impact, benefits and costs of the ban for the related trading partners.

Studies of economic sanctions (including trade bans) often attempts to estimate the cost of this policy for different stakeholders, such as imposing country, target country, consumers, producers and taxpayers on both sides of the sanctions. The cost of import ban impact can be assessed in different ways. For example, Gohin (2017) uses equivalent variation of well-being to calculate the impact of Russian import ban. Equivalent variation (EV) is calculated as follows:

$$EV = E(P^0, U^1) - E(P^0, U^0) \quad (3.7)$$

where P^0 – vector of prices for the initial situation (before the ban); $E(P, U)$ – household expenditure function; U^0, U^1 – utility before the ban and after the ban respectively.

Despite being relatively straightforward in theory, in practice this approach requires to determine two functions (household expenditure and utility) which cannot be easily obtained from statistical sources. At the same time, this approach is subject to several underlying assumptions, such as small variations of endogenous variables P and U, constant returns to scale and Shepard's lemma, stating that given the prices on the market, consumer will buy unique ideal amount of goods to obtain the maximum of utility with lowest cost.

Another approach to study the cost of Russian import ban was used by Boulanger et al. (2016). Authors used computable general equilibrium (CGE) modelling employing GTAP model (Hertel, 2007) to calculate the possible changes in trade and prices between countries of European Union and Russian Federation as a result of import ban. Based on the estimated prices they also estimated the equivalent variation of well-being using equivalent variation, as in previously mentioned work.

Both given approaches are albeit theoretically elegant but deal with variables that are sometimes difficult to obtain from publicly available statistical sources. At the same time, these approaches rely on underlying assumptions of neoclassical economic theory. Another feature of both methodological solutions is that they give aggregate results for the country but does not provide an insight on what are the actual changes in prices and well-being of producers and consumers in individual regions of the country in question. While it might not be a significant issue for countries with rather small differences in regional economics, it might lead to imperfect conclusions for countries with significant heterogeneity of regional economics. Russian Federation is an example of such a country.

One of the possible solutions in this case is estimation of import ban cost for consumers and producers by using prices and production volumes from publicly available databases, such as Russian Statistical Office and Organisation of Economic Cooperation and Development (OECD), employing the framework of Producer Support Estimate/Consumer Support Estimate (PSE/CSE) developed and supported by OECD. In this case, PSE/CSE framework should be further modified

in order to recalculate country CSE estimate to regional CSE estimates. This approach can help to determine impact on domestic producers and consumers (research question 2).

Consumer Support Estimate (or CSE) is one of the indicators characterizing the value of transfers to consumers of agricultural products as a result of the policies adopted in the country of interest. CSE was developed by OECD together with other indicators, such as Producers Support Estimate (or PSE) and others in order to evaluate the amount and direction of support to producers and consumers of agricultural commodities. (OECD, 2019). CSE is calculated for a specific commodity on country level. This approach gives an overview of a transfers in a country on macro level, while it does not capture the differences between separate regions. It can be a significant restraint for the countries with heterogenous regional structure of economic development. To overcome this, it is possible to estimate the differences in CSE between different regions (also called federal districts) of Russian Federation for a specified product in order to capture the influence of import ban introduced by Russian Federation for specified commodities on transfers to/from consumers.

CSE for milk consists of two components: transfers to producers from consumers (TPC) and excess feed cost (EFC). As EFC is less than 5% of CSE for the time series in scope of current research, excess feed cost is omitted. As a result, CSE is equal to TPC. Therefore, Consumer Support Estimate for milk is calculated as follows (OECD, 2019):

$$CSE_c = QP_c \times RP_c - QP_c \times PP_c \tag{3.8}$$

where QP_c - production volume of commodity c; PP_c - producer price of commodity c; RP_c - reference price of commodity c.

Regional CSE can be recalculated proportionally from country CSE, taking into consideration differences in production volumes and prices of products between regions (federal districts), as follows:

$$CSE_{cj} = \alpha_{1cj} \times QP_c \times \alpha_{3cj} \times RP_c - \alpha_{1cj} \times QP_c \times \alpha_{2cj} \times PP_c \tag{3.9}$$

where α_{1cj} - regional coefficient for QP_c; α_{2cj} - regional coefficient for PP_c; α_{3cj} - regional coefficient for RP_c.

CSE_c in different regions can be calculated according to the differences in productions quantities, producer's prices, and reference prices (assuming both PP_c and RP_c are constants among regions):

$$\alpha_{1cj} = \frac{QP_{cj}}{QP_c} \tag{3.10}$$

$$\alpha_{2cj} = \frac{PP_{cj}}{PP_c} \tag{3.11}$$

$$\alpha_{3cj} = \frac{RP_{cj}}{RP_c} \tag{3.12}$$

where QP_{cj} - production volume of commodity c in federal district j; PP_{cj} - producer price of commodity c in federal district j; RP_{cj} - reference price of commodity c in federal district j.

In case there are no difference in quality between imported and domestically produced products, and no weight adjustment made, reference price is equal to border price:

$$RP_c = BP_c \tag{3.13}$$

where BP_c – border price of commodity c;

As prices used in calculation are adjusted to the farm gate level, the costs of transportation of imported product to country's wholesale market increase reference price, while costs of transportation of domestically produced products to the wholesale market decrease reference price. Since reliable data on transportation costs in both directions are difficult to obtain, these costs can be omitted in majority of cases as per OECD methodology. This assumption also brings to the conclusion that:

$$\alpha_{3cj} = 1; j \in (1; n) \tag{3.14}$$

where n – number of regions.

As RP_{cj} is equal among regions, CSE_{cj} is only dependent on production volume QP_c adjusted by regional coefficient α_{1cj} and on producers' prices PP_c adjusted by regional coefficient α_{2cj}.

Another approach to recalculate CSE to regional level might be by using production volumes and producers' prices as variables, i.e. using QP_{cj} instead of QP_c. However, use of regional coefficients is needed in order to receive values comparable to OECD country estimates.

In order to answer the research question 4 (whether the trade effect of Russian import ban is uniformly distributed among main affected parties), an assessment of uniformity of import ban impact distribution is done by allocating the EU28 countries into clusters in accordance with the trade balance towards the Russian Federation. Cluster analysis is done using hierarchical agglomerative clustering (HAC) with Ward's linkage (Ward, 1963). Despite the limitations of the method (discussed, for example, by Randriamihamison et al. (2021)), it helps to define the groups of countries (clusters) that might have similar properties. In general, Ward's method defines the clusters by the optimal value of the objective function. The initial cluster distances are defined as follows:

$$d_{ij} = d(\{X_i\}, \{X_j\}) = \|X_i - X_j\|^2 \qquad (3.15)$$

This represents the calculation of cluster distances using squared Euclidean distance.

The trade impact of the ban can be assessed by projecting the trade development of the pre-ban years (2009–2013) into the years after the introduction of the import ban (2015–2019). The year 2014 should be excluded because the import ban was introduced in the middle of the year, and therefore the results might be distorted. Two scenarios of the import ban impact are evaluated: an optimistic scenario and a pessimistic scenario. The optimistic scenario represents the lower level of the import ban impact, while the pessimistic scenario includes the effect of opportunity costs and, therefore, represents a higher level of the import ban impact.

The optimistic scenario involves the following assumptions:

1. Agri-food exports from the EU28 countries in the absence of the Russian import ban would be constant in the period 2014–2019.
2. Agri-food exports from the EU28 in 2014–2019 remain at the 2013 level.

The pessimistic scenario involves the following assumptions:

1. Agri-food exports from the EU28 countries in the period of 2014–2019 would rise.

2. Agri-food exports from the EU28 countries in the period of 2014–2019 would show the same average dynamic (increase or decrease) as in the period of 2009–2013.

The pessimistic scenario assumes the calculation of the export growth ratio for each year of observation, which is done as follows:

$$\delta_{it} = \frac{X_{it}}{X_{i(t-1)}} \tag{3.16}$$

where $\boldsymbol{\delta_{it}}$—export growth ratio for country $\boldsymbol{i}$ in year $\boldsymbol{t}$; $\boldsymbol{X_{it}}$, $\boldsymbol{X_{i(t-1)}}$—export of goods to Russia for country $\boldsymbol{i}$ in year $\boldsymbol{t}$ and in the previous year, respectively.

The geometric mean of the export growth rate for each country is calculated for the period of 2009–2013 and is used to calculate the export loss or benefit according to the pessimistic scenario.

All in all, the choice of the methods to address individual research questions was driven by the attempt to complement the existing literature on the topic of economic sanctions, as well as provide new, and broad at the same time, view on the topic of Russian import ban. Partial results of the current study were published in scientific journals indexed in databases Web of Science and Scopus and are shown in Appendix 2.

3.3 Data

Data for the research comes from Federal State Statistics Service of Russian Federation (Federal State Statistics Service, 2020), OECD databases (OECD, 2019; OECD, 2021), Eurostat, governmental statistical bodies of European Union, the USA, Russian Federation. Data covers period of 2007-2019. The period of the data is chosen due to availability of comparable data. Additionally, data for the years 2020 was intentionally left out of scope of the study due to significant effect of supply chain disruptions evoked by COVID-19 pandemic. Data which can form complete dataset for the year 2021 was not available at official sources at the moment of the study finalization.

Dataset includes time series for import, export, production volumes, consumer prices, producer prices for agricultural products and commodities in scope of Russian import ban.

Variables included in dataset are obtained for Russian Federation and countries in scope of import ban (EU and the UK). Descriptive statistics of the dataset used for regression analysis are shown in Appendix 1.

While Russian Federation consists of more than 80 individual regions, each region is a part of a federal district. Where applicable and practical, current study focuses on federal districts of Russian Federation instead of individual regions. Federal districts of Russian Federation are mentioned in the text using abbreviations shown in Table 3.1.

Table 3.1. Federal districts of Russian Federation.

Federal district	Abbreviation
Central Federal District	CFD
North Western Federal District	NWFD
Southern Federal District	SFD
North Caucasian Federal District	NCFD
Volga Federal District	VFD
Ural Federal District	UFD
Siberian Federal District	SIBFD
Far Eastern Federal District	FEFD

Source: author's development based on Federal State Statistics Service (2020)

Dataset also includes the data obtained from OECD databases. This data represents variables reflecting various types of support to producers and consumers of agricultural commodities. Data provided by OECD cover OECD member countries, as well as several non-OECD countries.

One of the datasets used in the research contains data on Consumer Support Estimate (CSE) and Producer Support Estimate (PSE). As per the OECD definition, CSE is an indicator of the annual monetary value of gross transfers to (from) consumers of agricultural commodities, measured at the farm gate (first consumer) level, arising from policy measures which support agriculture, regardless of their nature, objectives or impact on consumption of farm products. PSE represents annual monetary value of gross transfers to (from) producers of agricultural commodities. (OECD, 2019)

As per the current practice, both indicators are usually used to evaluate the results of policies related to agriculture and adopted in the countries. The strong side of these indicators is in the fact, that they are able to capture the impact of all effects on agricultural sector despite the source of these impacts. The weak side is connected to the strong one: in some instances, CSE and

PSE does not provide an answer about what was the exact reason of the change in monetary transfers.

Another weak point of the CSE/PSE is that they are calculated by OECD for the whole country, and therefore does not capture the regional differences in prices and production volumes, which might be a significant issue for the countries with heterogenous regional economic structure. To overcome this limitation, recalculation of CSE/PSE indicators to regional level can be done based on the proposed recalculation methodology.

4 Overview of Russian import ban and related developments

4.1 Evaluation of Russian foreign agrarian trade

Before looking deeply into the topic of trade effects connected to the introduction and maintenance of Russian import ban, it is important to understand the developments in foreign agrarian trade of Russia in the past years, to gain more understanding of a ban introduction context. One of the comprehensive overviews of Russian foreign trade developments in recent decades is provided by Benešová et al. (2017). As an example, authors show that Russian agricultural exports grew at average annual rate of 24%, while agricultural imports grew by only 12%, and this situation was caused by an increasing demand paired with slow growth of domestic production capacities. Additionally, Russian agricultural trade and domestic agricultural sector can be characterized by large volumes of meat and meat products imports due to lack of domestic livestock production capacities and, simultaneously, large feed wheat exports. These facts established the path of increasing crop products exports and meat and meat products imports. At the same time, competitiveness of Russian agricultural exports was increasing in recent decades (Benešová et al., 2017), especially in relation to CIS, African and Asian countries, determined among others by geographic location connected with low cost of transport. High levels of dependency on imports for meat, vegetables and fruits was shown also by Mikhailushkin and Barannikov (2013).

Evidence of Russian dependence on imports of specific agricultural products shows that it is important to focus on two main aspects related to Russian import ban: Russian trade position in the banned products and re-export of banned products via neighbouring countries. Table 4.1. reports net export values for banned products before (2013-2014) and after (2015-2019) the introduction of the agricultural import ban.

Table 4.1. Net export of selected products within the scope of the Russian import ban, $ million. Codes as per HS.

	Meat 0207	Milk 0401	Butter 040510	Apples 080810	Canned meat 1602	Canned fish 1604
2013	-785.04	-252.93	-553.83	-789.66	-156.65	-185.26
2014	-736.68	-278.15	-602.13	-620.79	-142.74	-229.58
% change	-6.16%	9.97%	8.72%	-21.39%	-8.88%	23.92%
2015	-287.05	-151.19	-277.58	-387.2	-50.11	-156.38

% change	-61.03%	-45.64%	-53.90%	-37.63%	-64.89%	-31.88%
2016	-201.09	-130.03	-353.15	-370.87	-36.5	-145.82
% change	-29.95%	-14.00%	27.22%	-4.22%	-27.16%	-6.75%
2017	-187.92	-193.53	-476.9	-408.82	-34.88	-177.07
% change	-6.55%	48.83%	35.04%	10.23%	-4.44%	21.43%
2018	-171.29	-160.19	-371.13	-521.03	-36.65	-237.39
% change	-8.85%	-17.23%	-22.18%	27.45%	5.07%	34.07%
2019	-57.28	-196.01	-559.79	-394.29	-21.06	-222.61
2019/2013, % change	-92.70%	-22.50%	1.08%	-50.07%	-86.56%	20.16%

Note: negative values denote net imports. Source: Federal State Statistics Service (2020)

For many banned products, Russia was in the position of net importer before 2014. Taking into consideration the fact that those products were addressed in the 2010 Food Security Doctrine, it is interesting to note that the absolute values of net imports decreased as a result of the ban. In this relation, import ban might be considered as significant hit for the trade balance. Theoretically speaking, introduction of the import ban for the products, which are not produced in enough amounts by domestic producers, might put the domestic consumers under price pressure.

Are there indications of significant re-export from non-EU countries to Russia as a consequence of the import ban? The evidence is mixed, as there is no official data to track this issue. However, there are several considerations in favour of this hypothesis. The composition of food suppliers in the Russian market has changed in favour of neighbouring countries that used to have trade agreements with Russia. For example, Belarus has emerged as the largest supplier of cheese to Russia (78% of import of cheese in Russia in 2018 according to Volchkova and Kuznetsova (2019)). The trade statistics of Belarus show that the export of cheese had been growing before 2014 and the growth continued after Russia banned imports from Western countries (Figure 4.1.).

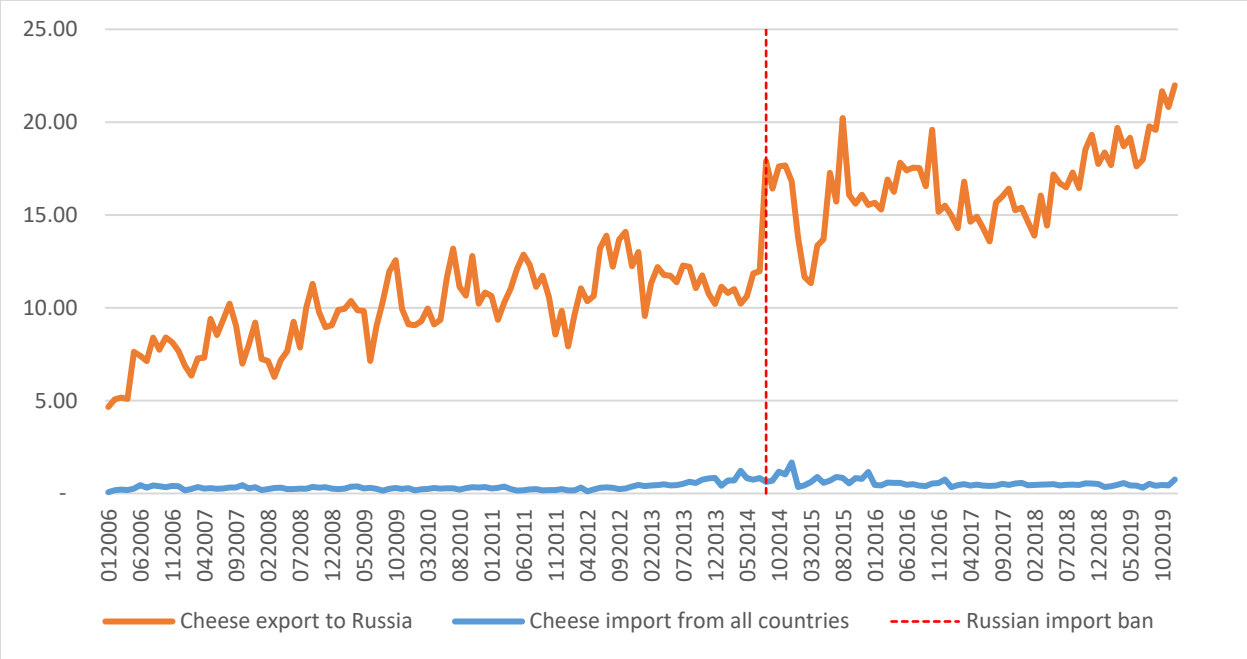

Figure 4.1. Export of cheese from Belarus to Russia and import of cheese to Belarus from all countries, thousands of tons

Note: the dotted line shows the introduction of the import ban

Source: National Statistical Committee of the Republic of Belarus (2020)

Belarus reported an increase in the volume of import of cheese products to ever high levels (up to 1.67 thousand tons monthly) between August and December 2014. The import of milk to Belarus increased dramatically in August 2014 (Figure 4.2.). On average, in 2009-2013, Belarus imported four thousand tons of milk monthly. In 2014, average monthly imports rose to 5.65 thousand tons, then declined to 4.74 thousand tons in 2015, and then increased to 8.77 thousand tons in 2016. Imports reverted to the levels of 2009-2013 in 2017-2018, when average monthly imports decreased from 560 tons (2017) to only 170 tons (2018). In 2018, the export of milk from Belarus to Russia saw a decline down to 10.81 thousand tons monthly. The capacity of Belarus' domestic market is too low to absorb such a dramatic increase in imports.

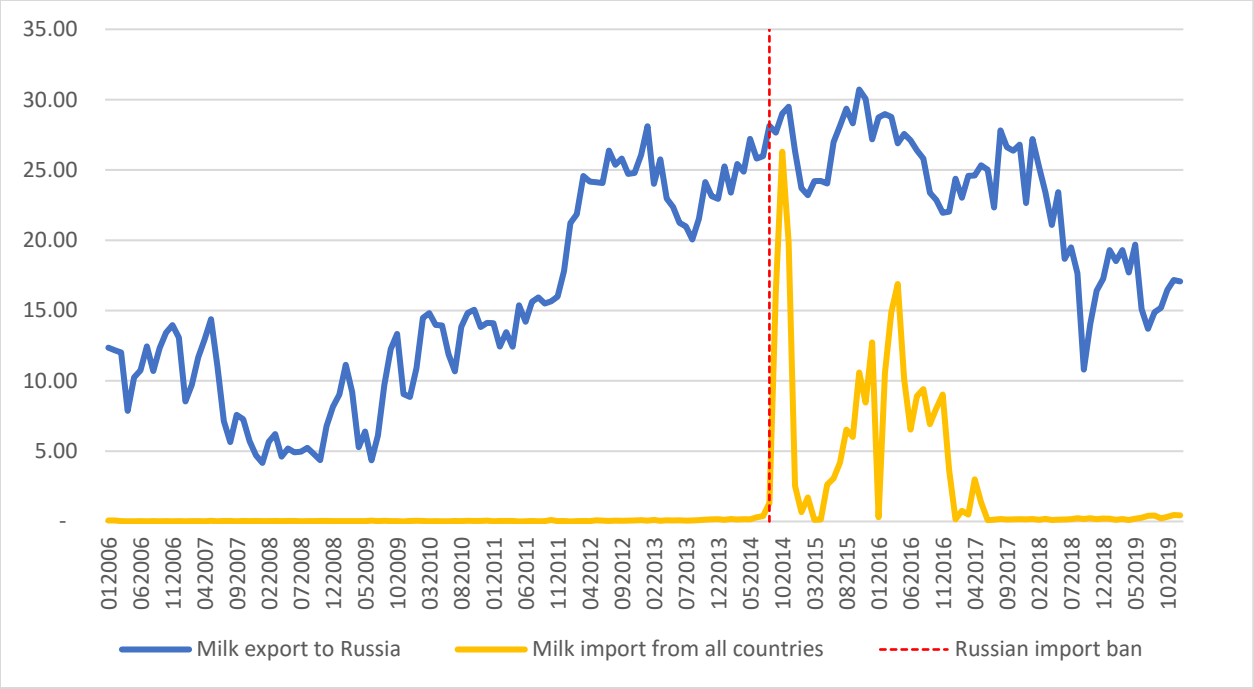

Figure 4.2. Export of milk from Belarus to Russia and import of milk to Belarus from all countries, thousands of tons

Note: the dotted line shows the introduction of the import ban

Source: National Statistical Committee of the Republic of Belarus (2020)

The production statistics of Belarus (Table 4.2) suggest that the country had already increased the domestic output of milk and cheese before 2014. The same stays true for milk and cheese exports to Russia. Given the constant level of demand for these products in Belarus, it is interesting to note the increase in the import of milk in 2014-2017 and the increase in the import of cheese in 2014-2015. The exports of cheese to Russia have been growing since 2013 from 136 thousand tons in 2013 to 233 thousand tons in 2019. The exports of milk to Russia increased from 277 thousand tons in 2013 to 320 thousand tons in 2015 but then declined to 204 thousand tons in 2019. Both facts support the assumption that Belarus is considering Russia's agricultural import ban as an opportunity to increase its supplies to Russia. It is not inconceivable that Belarusian producers import raw materials (milk) and semi-processed or processed products from countries from Russia's ban list (primarily, neighbouring Poland, Germany, Baltic states, and other EU countries) and then re-export these products to Russia.

Table 4.2. Production, import, and export of milk and cheese in Belarus in 2006-2019, thousand tons

Year	Milk output	Milk import to Belarus	Milk export to Russia	Cheese output	Cheese export to Russia
2006	5,895.4	0.34	141.36	3.60	82.52
2007	5,903.5	0.34	106.36	3.53	98.62
2008	6,224.6	0.33	65.09	3.28	101.69
2009	6,576.9	0.33	104.74	3.29	119.96
2010	6,624.6	0.38	162.37	3.24	127.20
2011	6,500.4	0.38	178.51	2.73	130.44
2012	6,766.3	0.60	293.13	3.25	141.93
2013	6,632.7	1.11	277.22	6.75	136.22
2014	6,702.9	**67.77**	318.56	**10.61**	164.04
2015	7,046.8	**56.83**	320.11	**8.60**	180.34
2016	7,140.0	**105.27**	310.45	6.27	201.22
2017	7,320.8	**6.74**	299.49	5.53	182.21
2018	7,344.6	2.00	234.71	5.77	198.71
2019	7,394.4	3.32	204.12	5.52	233.05

Note: values for years where abnormal variation is noticed are in bold

Source: National Statistical Committee of the Republic of Belarus (2020)

The re-export of semi-processed or processed products from the EU has become one of the issues in political relationships between Russia and Belarus after the introduction of the import ban. In economic terms, re-export of these products reduces the effect of the ban on consumers in terms of quality and supply, as consumers get access to a wider variety of products. However, the effect on prices (welfare effect) should be studied, as there are additional costs incurred by a re-exporter, as well as additional profits that a re-exporter expects to earn. If the volume of re-export is big enough, it might have a balancing effect on prices and decrease the dissatisfaction of consumers due to higher prices and a narrower range of products in grocery stores.

4.2 Food price changes in Russia after the ban

One of the most natural initial questions in relation to the topic of Russian import ban is whether food inflation in Russia increased as a consequence of the ban. Commonly, in a situation of constant demand, a decrease in supply moves prices up. As an increase in domestic production of banned foreign products takes time, price spikes happen due to a short-term decrease in supply. Rises can be tracked by cumulative consumer price index (CPI) for food products in Russia in case of prises of meat and meat products, milk and dairy products, and fish and fish products. In 2009-2014, prices rose at a constant pace. An exception is the prices of meat and meat products that stagnated at the end of 2012. Since mid-2014, a spike in prices has become evident which corresponds to the introduction of the import ban in August 2014 (Figure 4.3.).

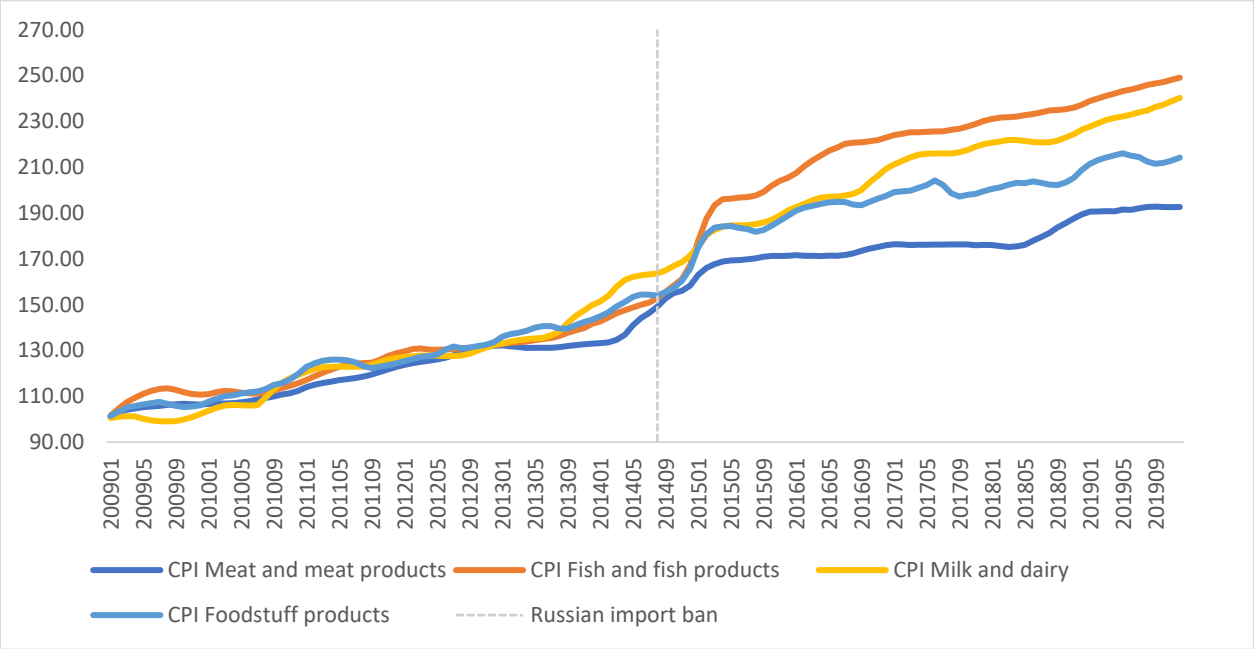

Figure 4.3. The cumulative consumer price indexes for banned products and overall consumer price index for food in Russia, 2009-2019, 2008 = 100

Note: the dotted line shows the introduction of the import ban

Source: Federal State Statistics Service (2020)

On average, the CPI for food products rose by 0.71 points monthly before 2014, while average growth rose to 1.5 points monthly in 2014, reaching its highest value of 9.37 points per month in January 2015. After deducting the average monthly growth in the CPI of food products (0.71 in 2009-2013), the index increased by 13.57 points in 2014 and 14.61 in 2015, or 28.18

points in just two years. In other words, a 28-point increase in the CPI for food products can be attributed to the events of 2014, one of which was the import ban. The greatest shock in foodstuff prices happened in December 2014 (4.5 points above the long-term average) and January 2015 (8.66 points above the long-term average). One event that coincided with this increase was the December 2014 peak of currency depreciation in Russia.

The price increase for banned products (meat and meat products, fish and fish products, milk and dairy products) in 2014-2015 was higher compared to the usual fluctuations in prices of these products. Vertical price transmission within supply chains should be taken into consideration to identify the part of the chain that had accumulated the largest benefits from the price increase. Figure 4.4. reports the cumulative increase in the producer price index (PPI) in 2012-2019 with 2012 as a base year.

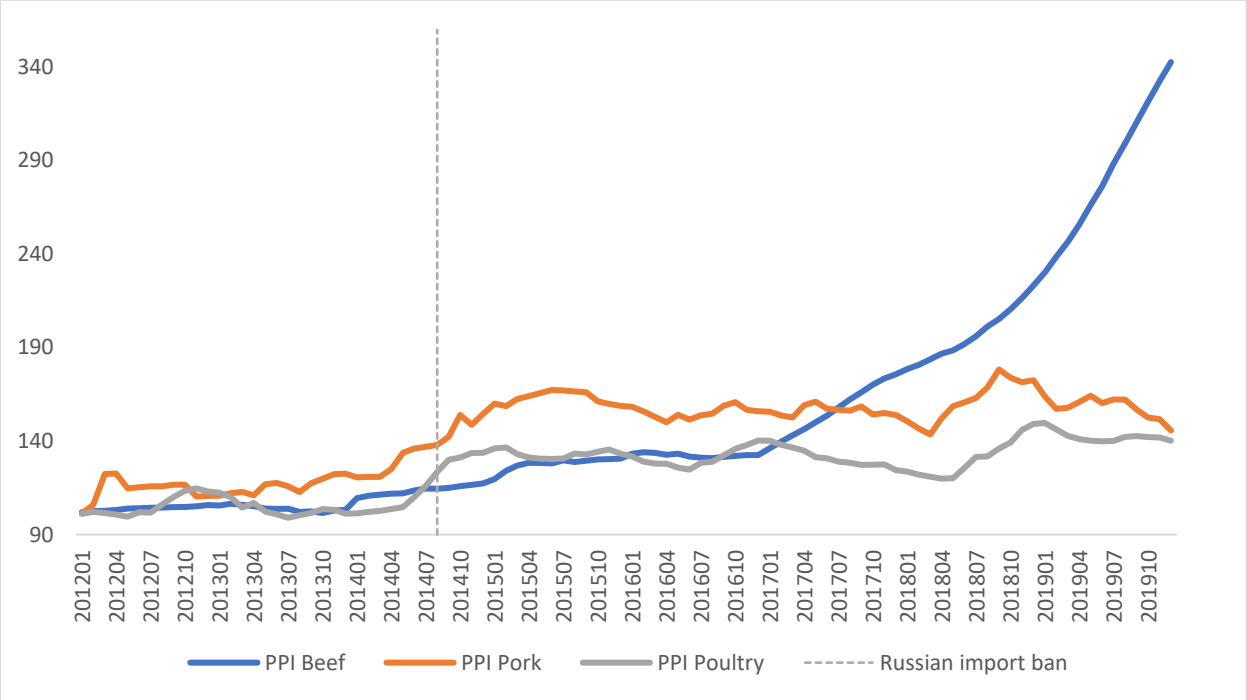

Figure 4.4. The cumulative producer price index for selected products, 2009-2019, 2011 = 100

Note: the dotted line shows the introduction of the import ban

Source: Federal State Statistics Service (2020)

Producer prices for pork, poultry, and beef started growing in 2014. The growth accelerated after the introduction of the import ban in August 2014. Since then, prices for pork and poultry have been oscillating around the levels achieved in 2014-2015. According to Volchkova and

Kuznetsova (2019), import substitution in Russia has been rather successful for pork and poultry, domestic producers have managed to provide an additional supply and compensate for the shortfall in imports. Import substitution partly stabilized domestic prices until the end of 2019. At the same time, producer prices for beef grew at a slower pace compared to those for pork and poultry, but they have shown a dramatic increase since the beginning of 2017. By the end of 2019, beef prices had increased by 3.4 times compared to 2011. As reported by Volchkova and Kuznetsova (2019), domestic consumption of beef decreased from 897 thousand tons in 2013 to 631 thousand tons in 2018, while production rose from 240 thousand tons to 291 thousand tons during the same period. Russian producers have failed to supply a sufficient volume of beef in the domestic market to make up for the shortfall caused by the import ban.

Comparing the consumer price index and producer price index, one can see that changes in producer prices were transmitted to consumer prices through the supply chain. As a result, Russian consumers of pork, poultry, and beef paid the cost of the ban, while agricultural producers received a price advantage. However, it is unclear whether producers have made full use of this advantage because, in the case of domestic beef production, they have failed to compensate for the shortfall in supply.

It is important to consider the depreciation of the ruble as one of the main economic events of 2014. The key role of oil prices in the context of sanctions was noted by Gurvich and Prilepskiy (2015). From March 2014 through February 2015, decreasing oil prices caused an increase in exchange rates. The ruble depreciated from 32.65 RUB/USD on January 1, 2014, to 69.66 RUB/USD on February 3, 2015. An increase in exchange rates makes imports more expensive, therefore, the volume of agricultural imports falls. Part of the demand switches to domestic producers. This has an upward effect on domestic prices in the short run. According to Zhupley et al. (2018), Russia's agricultural sector heavily depends on imported inputs. When a national currency depreciates, an increase in costs incurred by producers is transmitted through the supply chain to consumers (the case of meat prices in Russia). Increases in prices of both imported foods and foreign agricultural inputs caused an upward influence on food prices in Russia as they happened simultaneously with the introduction of the import ban.

4.4 Does Russian agriculture gain benefit from the import ban?

In an attempt to answer the question of whether Russian agriculture is gaining benefits from the import ban, it is important to define the parameters of such benefits. In the simplest view, Russian agriculture benefits from artificial and unexpected increases in domestic prices in the short term. It is possible to use the term "artificial" because the increase in prices is mostly driven by an immediate shortfall in supply, rather than an increase in demand. It is also possible to say "unexpected", because the introduction of the ban was never on the political agenda in Russia or any EAEU country before 2014. In this scenario, consumers bear the burden of the ban by paying higher prices for food and agricultural products. For some segments of consumers, additional costs might lead to poverty or a decrease in the consumption of other goods, affecting other sectors of the national economy. For some producers, the additional revenue generated due to the ban might allow them to invest additional funds in production capacities. With an increase in prices, the production of some agricultural products could become profitable for Russian farmers.

One of the ways to assess the effect of policy measures on gross revenues of agricultural producers and consumers' expenditures is the Producer Support Estimate/Consumer Support Estimate (PSE/CSE) methodology (Organisation for Economic Co-Operation and Development [OECD] 2020). This methodology provides an estimate of policy impact and therefore can provide meaningful results in the case of Russia's import ban. One of the PSE components is Market Price Support, a measure of additional revenue (or loss) obtained by domestic producers at the farm-gate level due to the difference between domestic and global prices (import or border prices). As MPS is denoted in national currency, it is possible to distinguish between the effects of the ban and the depreciation of the ruble.

In the dairy sector, the MPS had been oscillating between RUB50 and RUB100 billion annually before the introduction of the ban (the lowest in 2014) (Figure 4.5.). In 2015-2018, it increased sharply (more than twofold). Output volumes demonstrated a more modest increase. Therefore, the MPS was driven mainly by the difference between domestic and border prices. As output increased after 2014, the MPS dropped from RUB213.42 billion in 2018 to RUB94.57 billion in 2019, indicating a shrinking difference between domestic and border prices. Domestic producers have been receiving a significant benefit in terms of gross revenues since the introduction of the import ban in 2014, but this benefit seems to fade as time passes.

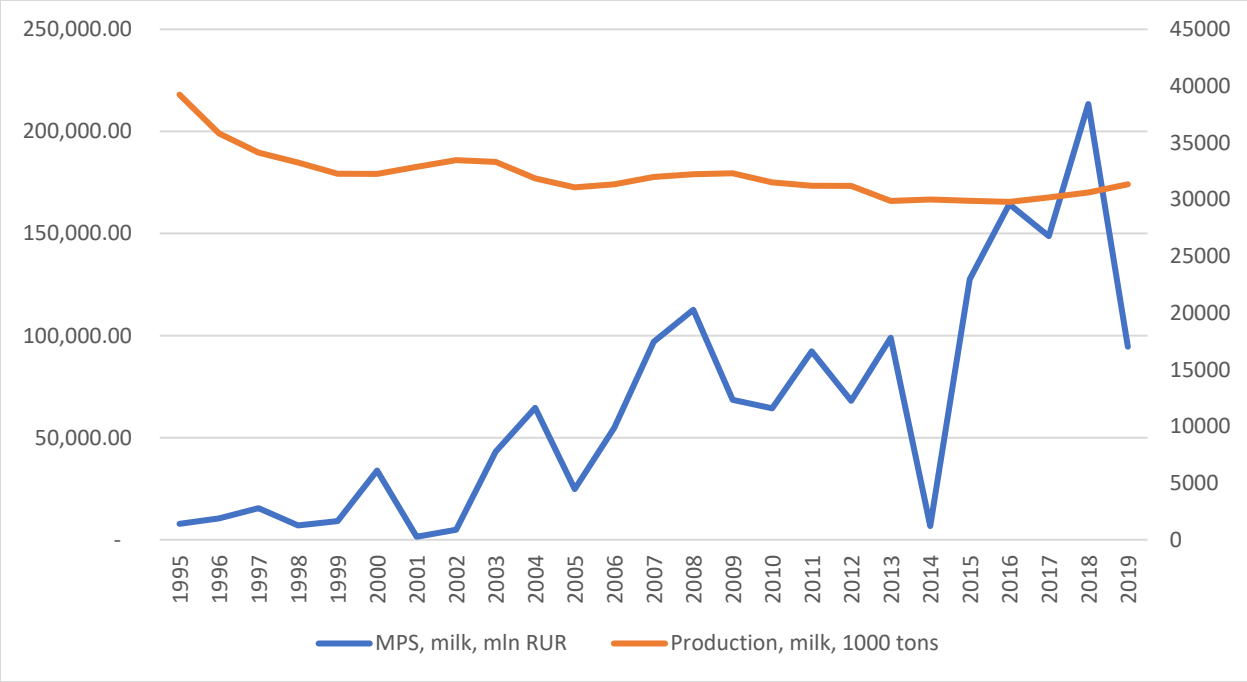

Figure 4.5. Market price support (MPS) (left axis) and milk output (right axis) in Russia

Source: OECD (2020)

Data for pork production (Figure 4.6.) shows a situation similar to that in the dairy sector: there was a spike in the MPS in 2014, but then during the period of growing production volumes market price support declined. Growing production did not offset the reduction in the difference between domestic and border prices.

In the case of poultry production (Figure 4.7.), the spike in the MPS happened in 2009, the year after the peak of the global financial crisis and long before the introduction of the agricultural import ban. The MPS seemingly rose after the ban was applied, reached RUB57.07 billion in 2017, but then declined.

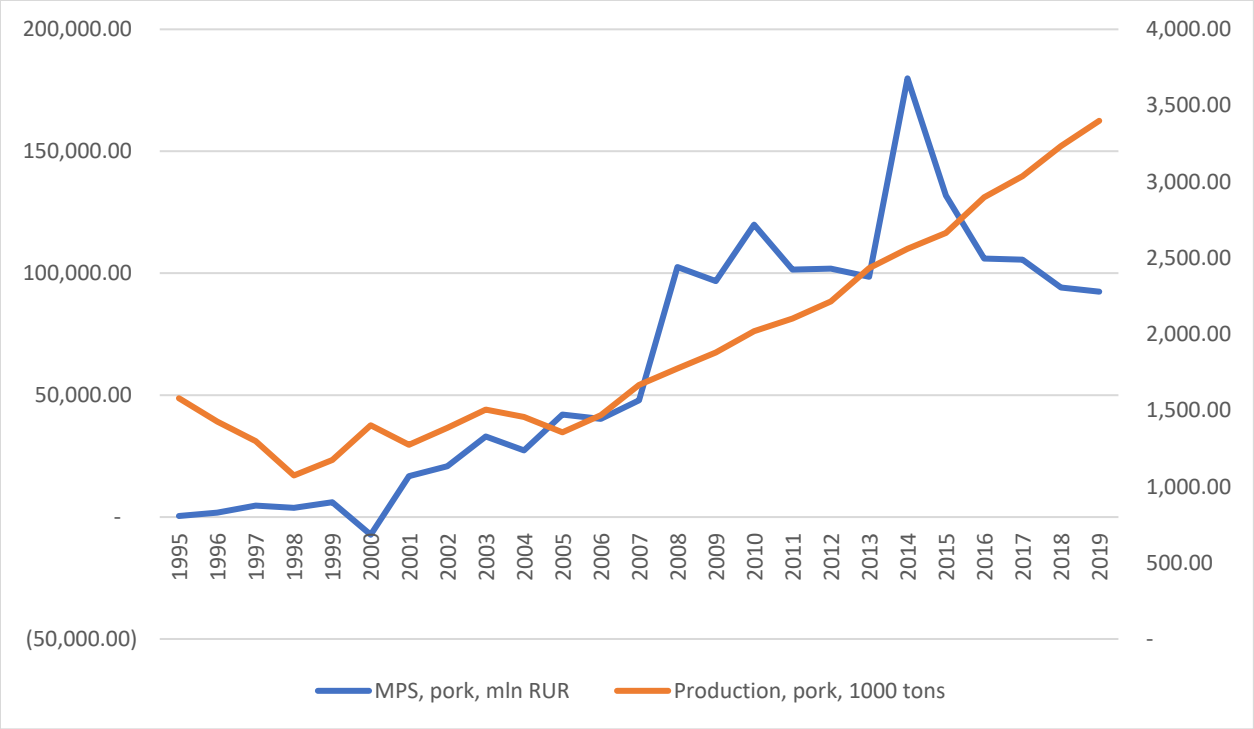

Figure 4.6. Market price support (MPS) (left axis) and pork output (right axis) in Russia

Source: OECD (2020)

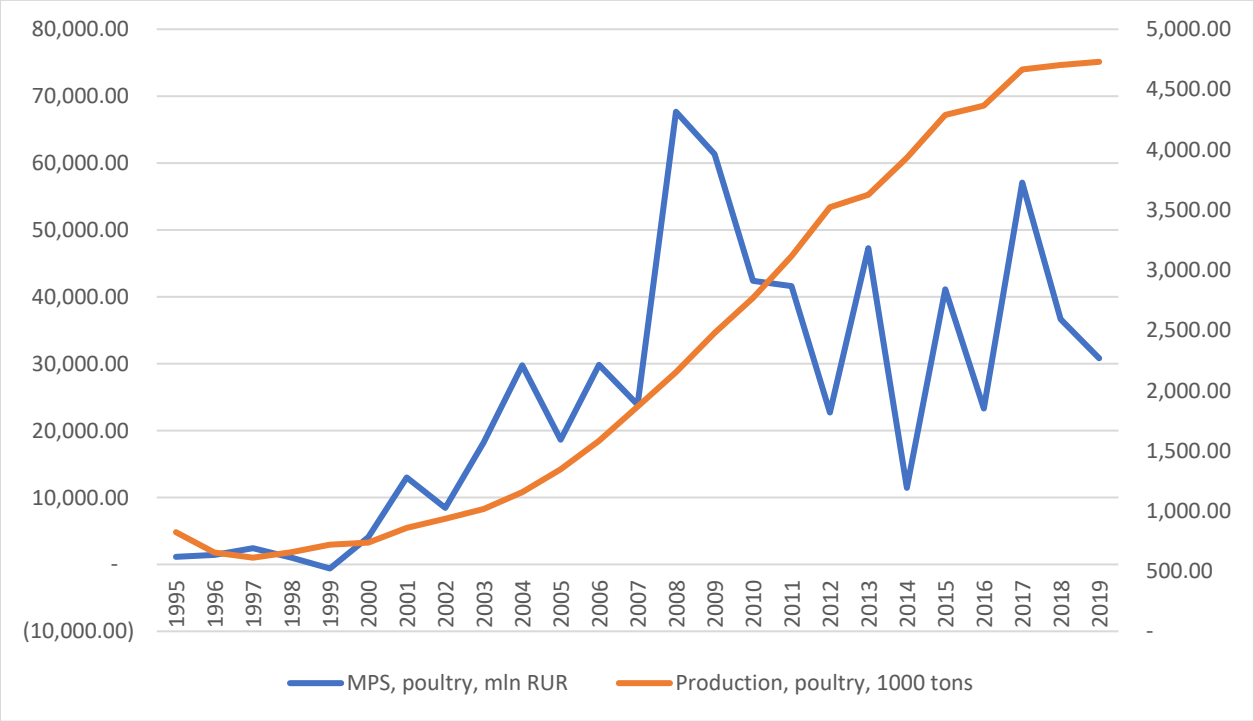

Figure 4.7. Market price support (MPS) (left axis) and poultry output (right axis) in Russia

Source: OECD (2020)

Other products, such as beef and veal, show a different picture compared to those in the dairy, pork, and poultry sectors (Figure 4.8.). In the case of dairy products, there was observed a change in the MPS trend (and therefore in the gross additional monetary benefit for domestic producers), but in the case of beef and veal production, the ban resulted in supporting existing levels of the MPS. The MPS value reached the highest ever level in 2013 (RUB78.37 billion). However, contrary to the dairy sector, market price support of beef and veal production seemed to increase in 2019.

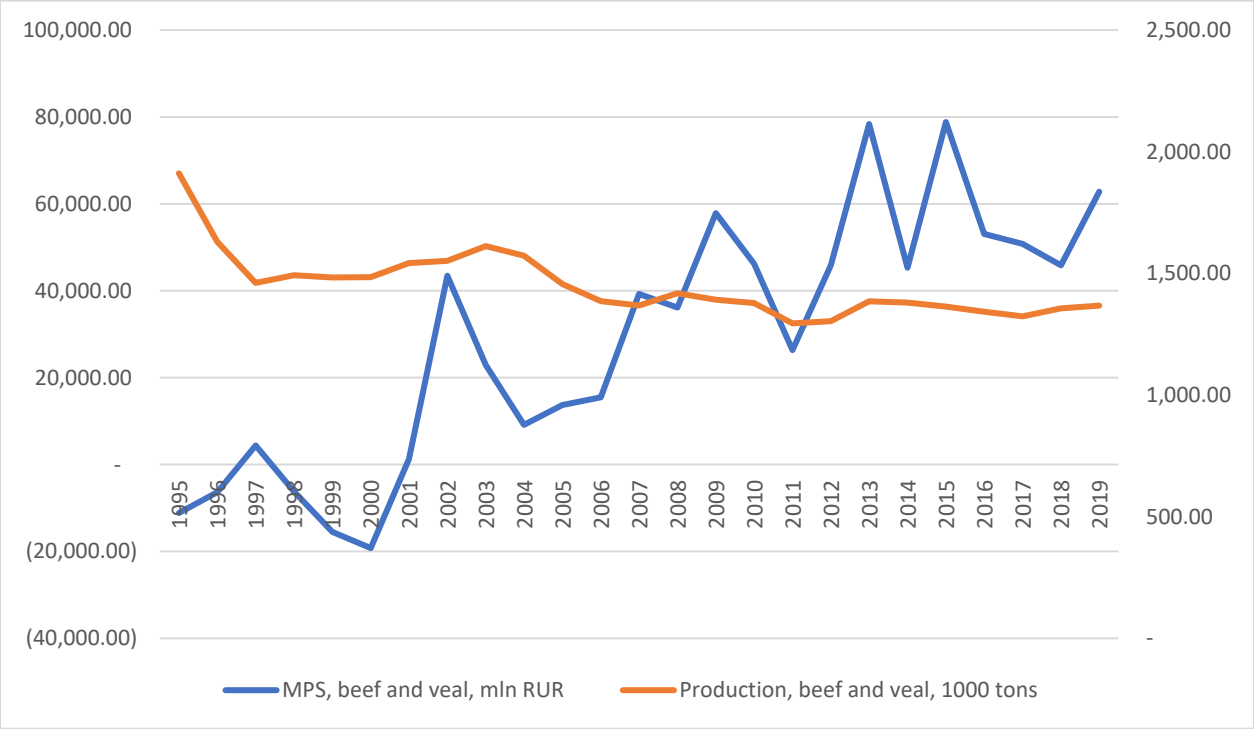

Figure 4.8. Market price support (MPS) (left axis) and output of beef and veal (right axis) in Russia

Source: OECD (2020)

Comparing four categories of agricultural products included in the ban list, one can notice that those four sectors received a different portion of additional benefit due to the ban (if any at all). There is clear evidence of increased MPS and therefore "artificial" and "unexpected" monetary benefit for producers of milk, pork, and poultry, while in the case of beef and veal production, the ban seemed to sustain existing levels of monetary support.

Every case of protectionism prompts a discussion concerning the cost of such a policy, whether or not it is beneficial, and ultimately who is the winner and who is the loser. Based on the

evidence gathered above, the following line of reasoning can be established. Before the ban, Russia was a net importer of many agricultural products, including those that were later banned. Food prices in Russia increased after the ban was introduced. The ban also coincided with the depreciation of the ruble, which might have a significant influence on domestic prices, as many of the banned products used to be imported. Some neighbouring countries (Belarus) increased the import of agricultural products banned by Russia to a volume that substantially exceeded internal demand. This could be the evidence of re-export of banned products (unprocessed or processed) to Russia, as both countries are members of the EAEU. The re-export decreased the effect of the ban in Russia. Nevertheless, market price support, which measures additional monetary benefit at the farm-gate level received by domestic producers, increased for milk, pork, and poultry, while in the case of beef and veal, it remained at the same level as before the ban. All in all, Russian agricultural producers have gained some benefit from the ban, while Russian consumers and European farmers have experienced losses. At the same time, the re-export of EU products via neighbouring countries reduced the negative effect of the ban on Russian consumers, although this compensating effect did not last long. In any case, as Russia's agricultural import ban has not been lifted at the moment, its full effect is yet to be assessed and evaluated.

Additional insight into the domestic effects of Russian import ban can be gained from the case study of specific product group. One of the most affected product groups is milk and dairy products. Next chapter attempts to perform the analysis of domestic import ban effects for this product group.

5 Regional dimension of Russian import ban effects: case of milk

5.1 Changes in producers' and consumers' support

Milk and dairy products belong to the product categories mostly impacted by the import ban. In this relation, it is important to have a deeper look into the case of milk as an example of a product category impacted by the ban. In this part, the impact of sanctions on milk and dairy industry in Russian Federal regions is described and assessed. Overall, based on the results, it is possible to argue that the sanctions do little harm to Russian agriculture but instead helped it to maintain new inflows of monetary transfers, which might result in gaining the new momentum.

It is also possible to argue that Russian Government has little incentive to lift the ban after five years as state support of agricultural producers has been effectively replaced by market price support. While this support still represents taxpayers' money, prevalence of market price support over state support require less administration costs and shows higher flexibility and resilience. All these facts bring one to the important question: is the ban sustainable for Russian consumers, producers, and state budget? This question has not been answered fully in the existing literature, therefore current chapter tries to add to the ongoing discussion by addressing the question of cost of self-sufficiency on the example of Russian import ban and the willingness of Russian Government to lift the ban.

Overall, the Russian Federation can be considered a country with significant regional differences in terms of milk industry. There are several dimensions to this fact, including geographical and historical reasons. In terms of geographical dimension, Russian Federation is the largest country in the world, covering the area of more than 17 million square kilometres, 16.3 million of which is rural land area, but only 13% of which is agricultural land. Thus, it is relatively difficult to consider Russian Federation as a homogeneous economy, because unlike many other countries, differences in prices and production volumes between regions of Russia might differ more than between different countries of the world.

Market shares of federal districts have changed between 2013 and 2017 (Figure 5.1). Most remarkable changes are evident in two cases: market share of Southern Federal District has risen from 10.82% in 2013 to 11.84% in 2017, while market share of Central Federal District has increased from 18% in 2013 to 18.30% in 2017.

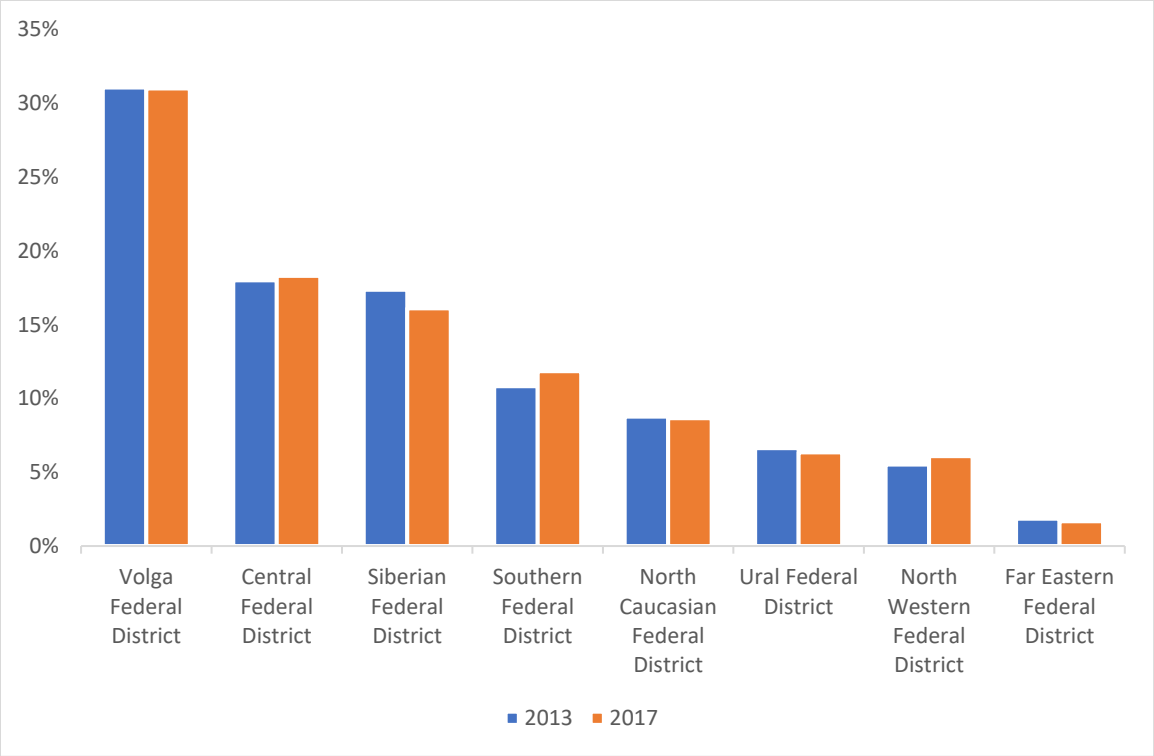

Figure 5.1. Changes in market shares of milk production of Russian federal districts in 2013 and 2017.

Source: OECD (2019).

Market shares of federal districts presented on the Figure 1 show, that federal districts are different in terms of production volumes, which is not unexpected, however important to put into the context of changes induced by Russian import ban.

Heterogeneity of regional economies of Russian Federation might be assessed by two means. Student's two-sample t-test can be used to test the null hypothesis of equal mean among production volumes of federal districts of Russia (see Table 5.1 below, abbreviations are the same as given in Table 3.1).

Table 5.1 t-statistics for milk production volumes in federal districts of Russian Federation, 2000-2019.

	CFD	**NWFD**	**SFD (+NCFD from 2010)**	**VFD**	**UFD**	**SIBFD**	**FEFD**
CFD	-	22.60***	-	22.60***	-	22.60***	-
NWFD	-22.60***	-	-20.41***	-69.61***	-3.26***	-50.00***	29.92***

SFD (+NCFD from 2010)	-3.64***	20.41***	-	-23.82***	19.86***	-1.04	29.10***
VFD	17.36***	69.61***	23.82***	-	71.39***	36.43***	86.61***
UFD	-22.11***	3.26***	-19.86***	-71.39***	-	-54.24***	53.96***
SIBFD	-3.69***	50.00***	1.04	-36.43***	54.24***	-	83.22***
FEFD	-30.14***	-29.92***	29.10***	-86.61***	-53.96***	-83.22***	-

*Source: author's calculations based on Federal State Statistics Service (2020). ***-p-value<0.01.*

Estimated t-statistics allow to reject the null hypothesis of equal means in all the cases, except the pair of Siberian Federal District and Southern Federal District. The last pair shows similarity in mean values of production for the observable period. However, the p-value of the estimated statistics is higher than 0.1. Therefore, the null hypothesis of equal means cannot be rejected in this case. This allows to conclude, that Southern and Siberian FDs have common direction in production volumes. Nevertheless, all other regions do not show similarities in production volumes, suggesting high level of heterogeneity in terms of production among Russian regions.

Results of t-test for producers' prices of milk show that null hypothesis of equal means cannot be rejected in most of the cases, except pairs of Far Eastern FD and Volga, Ural, and Siberian FDs (Table 5.2). This fact shows that producer prices of milk in only one region (Far Eastern FD) did not have equal mean with other regions during the observable period. Comparison with production volumes suggests that regions of Russia are different in production volumes, however producer prices follow similar direction in most of the regions. Far Eastern FD takes specific place among all other regions in terms producer prices, but production volumes in this region follow similar pattern.

Table 5.2 t-statistics for producers' prices of milk in federal districts of Russian Federation, 2000-2019.

	CFD	**NWFD**	**SFD (+NCFD from 2010)**	**VFD**	**UFD**	**SIBFD**	**FEFD**
CFD	-	-0.04	0.16	0.64	0.27	0.48	-2.14
NWFD	0.04	-	0.22	0.73	0.34	0.56	-2.20
SFD (+NCFD from 2010)	-0.16	-0.22	-	0.50	0.11	0.32	-2.37
VFD	-0.64	-0.73	-0.50	-	-0.41	-0.21	-2.87***
UFD	-0.27	-0.34	-0.11	0.41	-	0.22	-2.56***
SIBFD	-0.48	-0.56	-0.32	0.21	-0.22	-	-2.81***

FEFD	2.14	2.20	2.37	2.87***	2.56***	2.81***	-

*Source: author's calculations based on Federal State Statistics Service (2020). ***-p-value<0.01.*

Another way to get a quick glance on the regional heterogeneity can be in the use of two-way ANOVA for milk prices and production data of Russian regions (Table 5.3 and Table 5.4) with null hypothesis formulated as equality of means among regions and among years of observation. Dataset contains milk production volumes for years 2000-2017 and for 7 federal districts. Data for North Caucasian Federal District is included in the time series of Southern Federal District.

Table 5.3 Milk production volumes in federal districts of Russian Federation, 2000-2019, ANOVA.

Source of Variation	SS	df	MS	F	P-value	F crit
Years	2466179	17	145069	0.674	0.82	1.724
Federal Districts	1140410440	6	190068406	883.328	0.00***	2.189

*Source: author's calculations based on Federal State Statistics Service (2020). ***-p-value<0.01.*

The null hypothesis for the ANOVA comprises that variances are equal between datasets. When federal district is the source of variation, the F-statistic is much higher than critical F-value, therefore null hypothesis should be rejected. F-statistic has a high p-value when years are set as source of variation, therefore F-statistic is not significant in this case and cannot be considered.

Table 5.4 Producers' prices of milk in federal districts of Russian Federation, first differences, 2000-2019, ANOVA.

Source of Variation	SS	df	MS	F	P-value	F crit
Years	59037585	13	4541352	1.390	0.18	1.848
Federal Districts	6232633	6	1038772	0.318	0.92	2.217

Source: author's calculations based on Federal State Statistics Service (2020).

Analysis of variances for milk prices dataset shows that means are equal in terms of years and federal districts. Null hypothesis cannot be rejected which leads to a conclusion of low heterogeneity of Russian regions in terms of milk prices. Based on this, it is difficult to assess transfers from consumer to producers as a result of import ban on the country level. Deeper separation of the country into regions might show more realistic picture of transfers and reveal the position of producers and consumers of milk after the introduction of Russian import ban.

There is an evidence of significant differences between Russian federal districts in terms of both direction and value of transfers from consumers to producers of milk. At the same time, direction of transfers varies between federal and regional levels. Table 5.5 shows the TPCs for different commodities provided by OECD. In comparison to other commodities in scope of Russian import ban, milk has the highest value of transfers to producers from consumers.

Table 5.5 TPCs of selected commodities for the Russian Federation, 2010-2019, mln Rub.

Year	Milk	Potatoes	Beef and Veal	Pigmeat	Poultry
2010	63,517.14	0.00	45,824.32	118,209.24	41,751.06
2011	82,757.29	0.00	21,711.82	88,386.28	34,095.87
2012	62,821.85	0.00	42,841.15	83,853.05	16,887.30
2013	1,856.53	0.00	77,720.99	69,182.44	45,895.96
2014	56,648.11	26,961.84	39,001.33	133,733.21	2,574.61
2015	121,054.12	0.00	69,209.71	78,672.39	27,442.29
2016	223,313.25	0.00	45,272.71	60,264.43	17,144.58
2017	143,685.30	0.00	42,419.05	59,222.22	54,052.25
2018	224,804.51	0.00	56,959.16	39,337.24	33,473.07
2019	36,607.61	0.00	63,435.21	93,741.03	31,094.07

Source: OECD (2019).

Data on TPC provided by OECD suggests that transfers to producers from consumers have significantly raised after 2014 in case of milk and poultry, at the same time the magnitude of increase is lower for poultry than for the milk. Outstanding dynamics of TPC for milk can be noticed on Figure 5.2.

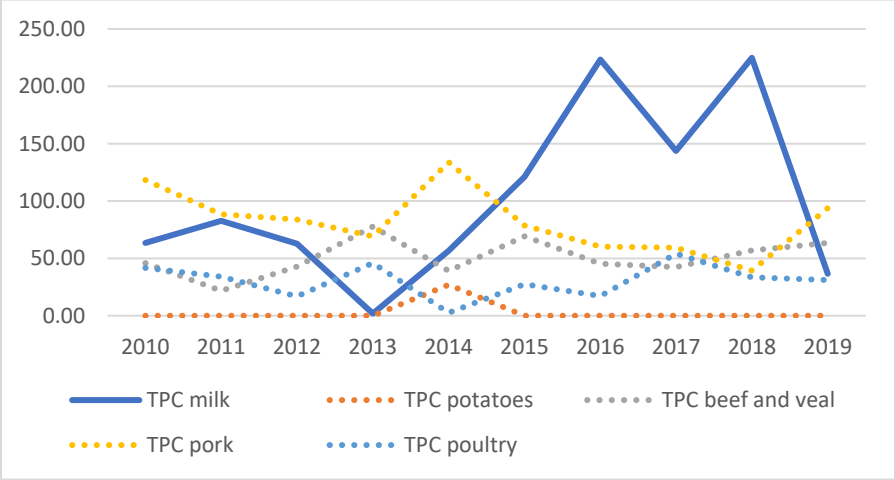

Figure 5.2. Transfers to producers from consumers (TPC)s for different commodities in Russian Federation, in Russian roubles.

Source: OECD (2019).

TPC for milk started to rise from its lowest point of 1,856.53 m roubles in 2013 to achieve an increase of more than 15 times in 2018. Other commodities in scope of Russian import ban (potatoes, beef and veal, pig meat, poultry) showed slight increase after 2014 and decrease in the period of 2015-2016. Such significant increase in value of TPC might show the de-facto monetary support to Russian producers of milk by Russian consumers conveyed through the price channel. However, before identifying the source of higher TPC values, it is important to understand the split of the TPC between different regions of Russia.

Development of calculated regional TPCs for federal districts of Russian Federation are shown in the Figure 5.3.

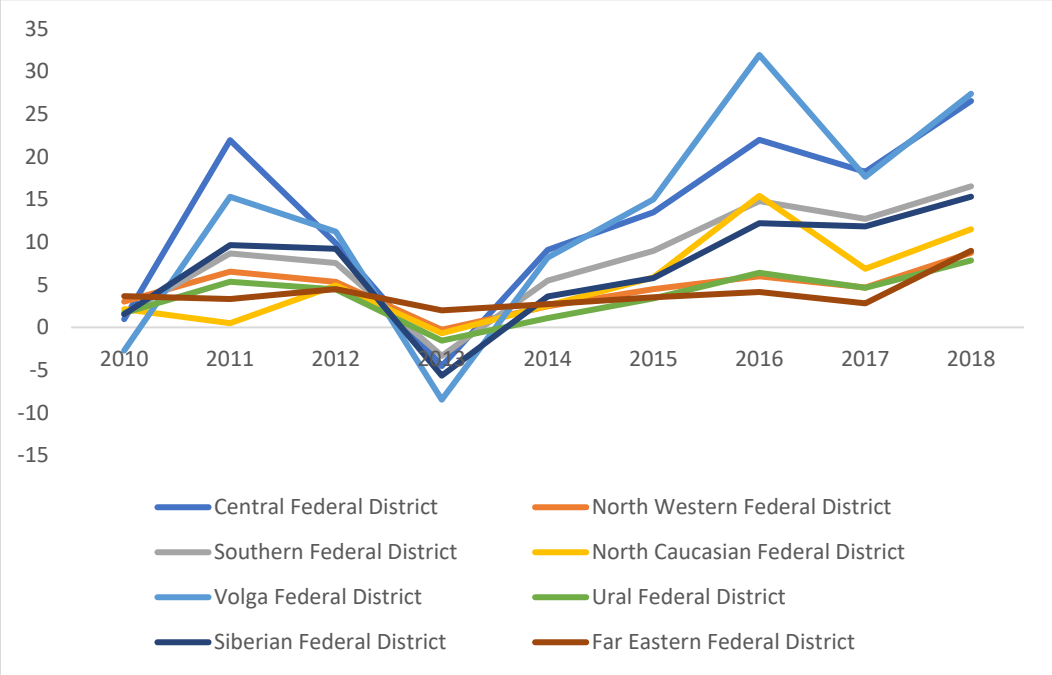

Figure 5.3. Similar trends in transfers to producers from consumers of milk (TPC) for federal districts of Russian Federation, adjusted for inflation, bln Rub. Correlation coefficients among all pairs of districts, except for pairs involving Far Eastern and North Caucasian districts, are greater than 0.9.

Source: author's calculations based on Federal State Statistics Service (2020) and OECD (2019). Data for year 2019 is not shown due to changes in structure of federal districts which makes TPC data and calculations not comparable.

In case of milk in 2013 (before import ban), transfers to producers from consumers (or TPC) were close to zero on federal level as per the OECD estimate. At the same time, recalculation methodology gives negative TPC for all federal districts except Far Eastern, while the main driver

is the difference between regional producer prices and reference price. Volga Federal District was the region with lowest TPC among regions, with value of 8,468 m rubles, while North Western Federal District was the region with the closest to zero TPC of 273.61 m rubles. In 2015, the next year after the import ban was introduced, all regions have shown change from negative to positive values of TPC, and Central Federal District was the leader with positive TPC of 9,083 m rubles. Ural Federal District became a region with lowest TPC of 1,088 m rubles while North Western Federal District showed TPC of 2,488 m rubles.

Russian import ban has resulted in increased transfers from consumers to producers due to increase in producers' price. This effect is evident across all Russian regions and without exception. Effectively, import ban provided milk producers with monetary support due to differences between actual price on the regional market and possible border price, i.e., price of imported products. Moreover, the increases in TPC were observed in all the regions after 2014, and the main driver of the increase is growing producers' price. Producers' prices of milk in Russian regions are shown on the Table 5.6.

Table 5.6 Producers' prices of milk and price growth factors for federal districts of Russian Federation, first differences, adjusted for inflation, Rub per tonne.

Year	CFD	NWFD	SFD	NCFD	VFD	UFD	SIBFD	FEFD
2011	566	4424	2356	2892	-771	2233	1965	1476
2012	-260	-1975	-245	-41	2509	14	67	627
2013	3602	1808	1216	1006	2515	2566	1467	1546
2014	1357	3026	1826	3697	1311	2306	1504	2174
2015	1000	1439	1774	999	1869	627	1824	395
2016	3645	3039	1261	3058	6198	2943	2599	1646
2017	1329	320	3949	542	-3464	1857	1597	9091
2018	-1700	-257	-2617	-1104	-2656	-1304	-2533	1949
2019	4118	2832	4516	-848	4473	1938	4567	6027
	Price growth factors							
2019/2010	1.995	2.274	2.046	1.870	1.966	2.207	2.050	3.114
2014/2010	1.383	1.633	1.384	1.645	1.449	1.652	1.402	1.494
2019/2014	1.442	1.392	1.478	1.137	1.357	1.336	1.462	2.085

Source: author's calculations based on Federal State Statistics Service (2020).

All Russian regions experienced growth in producers' prices of milk during observed period of 2010-2016. However, the assessment of average year-on-year growth rates shows that the price growth changed after 2014 (Table 5.7).

Table 5.7 Changes in producers' prices of milk for federal districts of Russian Federation, adjusted for inflation, chain index.

Year	CFD	NWFD	SFD	NCFD	VFD	UFD	SIBFD	FEFD
2011/2010	4%	38%	18%	25%	-6%	20%	16%	13%
2012/2011	-2%	-12%	-2%	0%	22%	0%	0%	5%
2013/2012	26%	13%	8%	7%	18%	19%	10%	11%
2014/2013	8%	19%	11%	24%	8%	15%	9%	14%
2015/2014	5%	8%	10%	5%	10%	3%	10%	2%
2016/2015	18%	15%	6%	15%	31%	16%	13%	9%
2017/2016	6%	1%	18%	2%	-13%	9%	7%	46%
2018/2017	-7%	-1%	-10%	-5%	-12%	-6%	-11%	7%
2019/2018	18%	12%	20%	-4%	22%	9%	22%	20%
Average YoY 2010-2014	9%	15%	9%	14%	10%	14%	9%	11%
Average YoY 2015-2019	8%	7%	9%	3%	8%	6%	8%	17%

Source: author's calculations based on Federal State Statistics Service (2020).

All Russian regions, except Ural and Far Eastern federal districts, yielded an increase of producers' price of milk after 2014 in the range from 2.2% (Volga federal district) to 14.07% (Far Eastern federal district). The highest increase is observed in Far Eastern federal district which was preceded by already high price rise in 2010-2014 (in average by 11.45% annually). Chain index (presented in Table 5.7) shows that producer prices of milk had the highest pace of increase in 2014, the year in which Russian import ban was introduced. At the same time, many federal districts experienced two-digit growth in 2015, 2016 and in 2017. It is interesting to notice, that prices were decreasing in 2018, while milk production has significantly increased in 2017 (this will be touched upon later in Figure 5.6).

Table 5.8 Changes in calculated TPCs for federal districts of Russian Federation, inflation adjusted, mln Rub.

Year	CFD	NWFD	SFD	NCFD	VFD	UFD	SIBFD	FEFD
Average 2010-2013	7,059.59	3,657.47	3,606.79	1,721.00	3,833.33	2,485.78	3,685.90	3,368.90
Average 2014-2017	15,693.37	4,410.91	10,495.19	7,678.46	18,191.58	3,882.58	8,371.73	3,307.64
Absolute change of average	8,633.78	753.44	6,888.41	5,957.46	14,358.25	1,396.79	4,685.83	-61.26
% change of average	122.30%	20.60%	190.98%	346.16%	374.56%	56.19%	127.13%	-1.82%

Source: author's calculations based on Federal State Statistics Service (2020).

All in all, there is an evidence of price increase and, in turn, increase in transfers from consumers to producers. Pace of this increase has been different for federal districts of Russian Federation, and effect is fading after 2017, however changes in transfers have influenced the structure of support for agricultural producers in Russia. Unlike neighbouring countries (mainly, member states of European Union), structure of support has been changed, and the burden of support has been moved from taxpayers to consumers. This issue should be investigated more closely.

5.2 Is there an incentive to lift the ban?

According to the recalculations of federal TPC to regional level as per proposed methodology, all regions, except Far Eastern Federal District, yielded an increase in four-year averages after 2013, i.e., after introduction of import ban. Four-year average of federal TPC for milk has grown from 52,738 m rubles in 2010-2013 to 136,175 m rubles in 2014-2017 which equals to 83,436 m rubles absolute increase. The region with highest absolute increase of TPC is Volga Federal District where it has grown from 3,833 m rubles in 2010-2013 to 18,191 m rubles in 2014-2017.

After import ban introduction, four-year average value for milk TPC changed by 158.21% on federal level while the percentage changes on regional level differed from federal level. The most notable recorded change was in case of Volga Federal District (374%) while smallest change was in Far Eastern Federal Region, where four-year average has declined by 1.82%. Results for Far Eastern Federal District may be supported by the fact that supply chains in this region are in the position of lowest dependence on the imports from the countries under import ban, while, for example, Volga Federal District is one of the regions with highest import from the countries under the scope of import ban.

Transfers to producers from consumers is one of the types of support for agricultural producers. Specifically, TPC falls into the category of support based on commodity output. As can be seen from the OECD data (Figure 5.4), this type of support has become the biggest vehicle of support for agricultural producers in Russia after 2014. Share of support based on output has increased from 52.26% in 2013 (before import ban) to 71.47% in 2018, together with decrease in share of payments based on input use from 37.23% in 2013 to 21.69% in 2018. Support for agriculture has shifted to support through price channel, rather than to support from state budget

to the contrast with European Union, where decoupled support has become the main support type for producers (Figure 5.5).

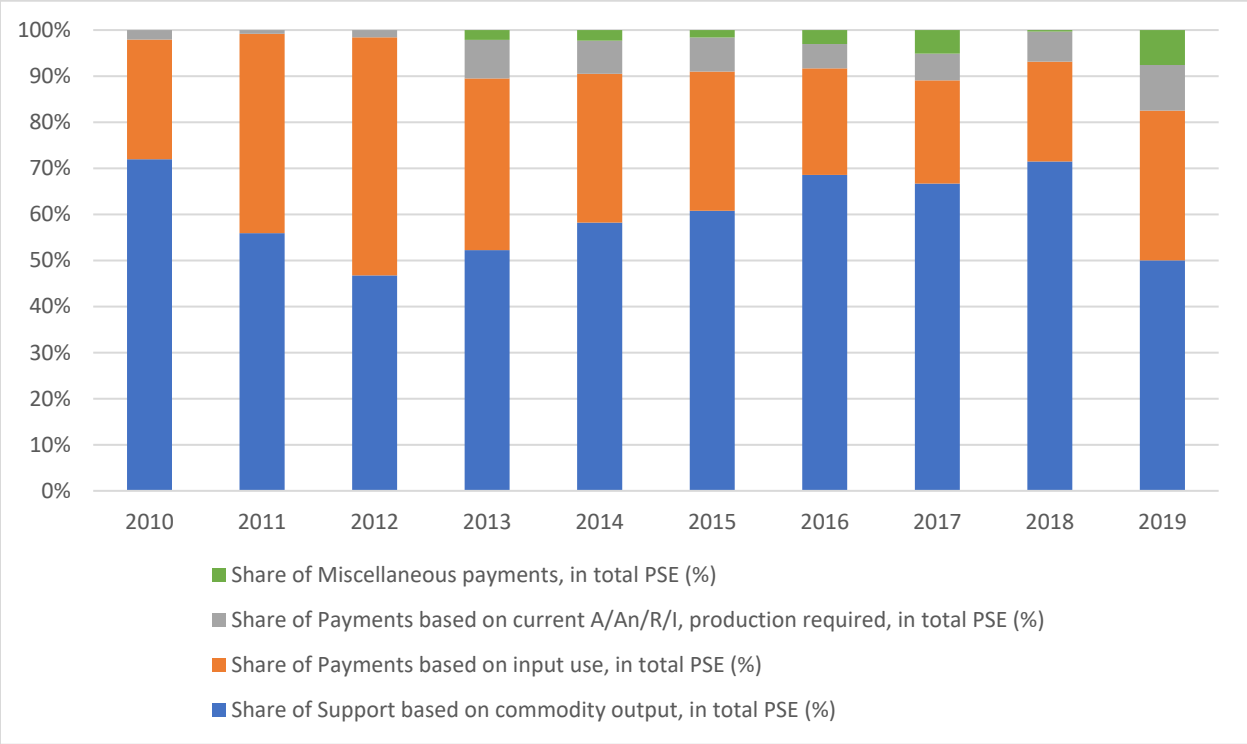

Figure 5.4 Structure of support for agricultural producers in Russia in 2010-2019.

Source: OECD (2019).

European Union, main exporter of milk and dairy products to Russia before import ban, has changed the structure of agricultural support during 2010-2019 in a different direction, as opposed to Russia. Biggest part of support is attributed to payments based on non-current area, animal number, receipts or income, with production not required (Figure 5.5). At the same time, share of payments based on current area, animal number, receipts or income with production required has increased from 19.67% in 2010 to 25.42% in 2018.

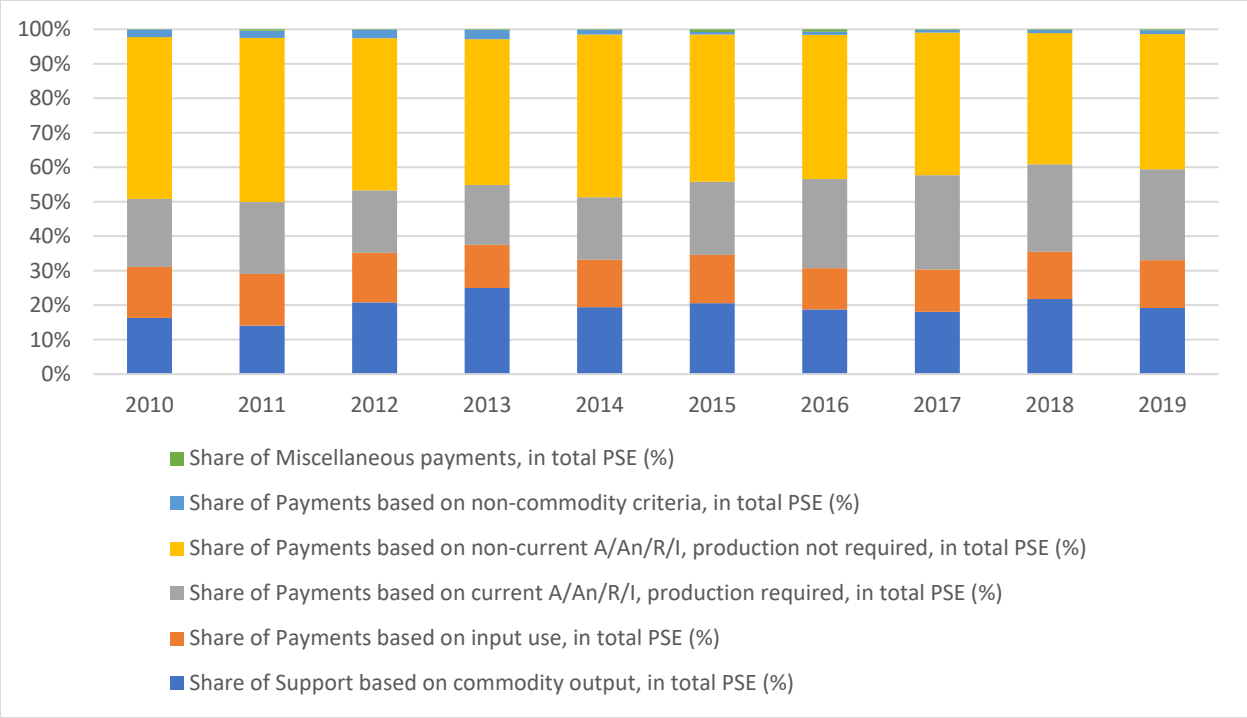

Figure 5.5 Structure of support for agricultural producers in EU28 in 2010-2019.

Source: OECD (2019).

Increased transfers from consumers to producers should have resulted in additional benefits to producers. It should also have acted as an additional incentive to invest in production facilities, which should then lead to increase in production. Interestingly, milk production has been growing since 2016 in Russia, and declining since 2014 in European Union, which is shown on Figure 5.6.

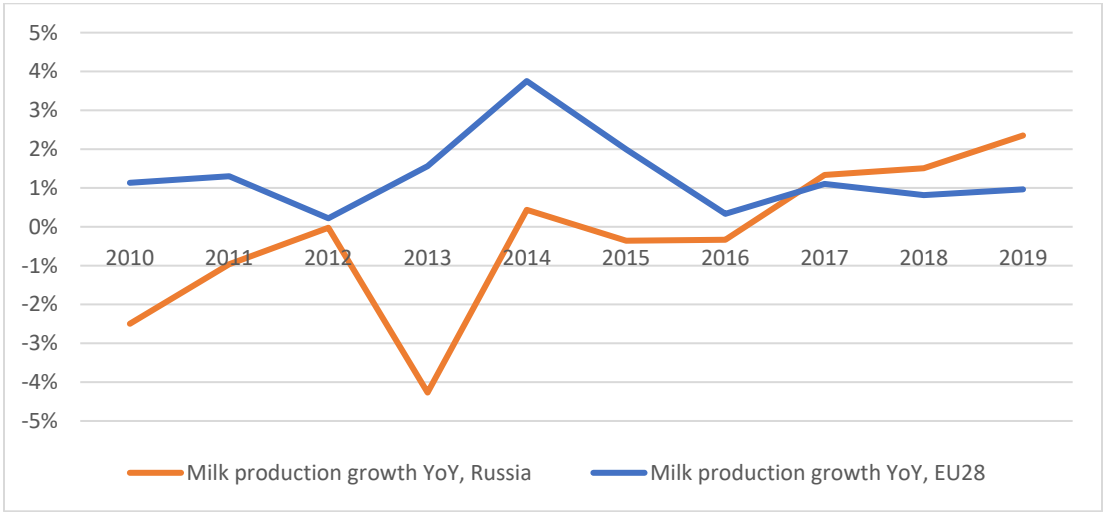

Figure 5.6 Milk production growth year over year in Russia and EU28.

Source: author's calculations based on OECD (2019).

Production volumes in dairy industry in Russia has started to grow in 2017, two years after Russian import ban. As was mentioned by Semenova and Shumeiko (2019), Russian dairy industry can be characterized by lag between demand and production, which is reflected in production growth of 2014-2018.

Petrick and Götz (2019) have argued, that current practices of subsidizing Russian dairy producers do not result in herd growth. Comparing structure of producers' support in Russia and EU28, it is possible to see that subsidies are not the main channel of support for agricultural producers. Share of support, that is not connected to output (payments based on input use, payments based on current area and animal number), has been declining in Russia since 2012 (53.24% of total support) to 28.19% in 2018. Therefore, investments in dairy industry in general terms, and herd growth in particular, might be more closely associated with support based on commodity output, or support through price channel.

As one of the results of import ban, Russia has chosen a different way, in the contrast with European Union. As there is a clear trend to decoupled payments for agricultural producers in European Union, Russian agricultural producers receive more support from consumers through marginally higher prices. Comparing production growth in EU28 and Russia, one can notice that this approach has resulted in higher growth of milk production in Russia, rather than in European Union. From this point of view, there is little incentive for Russian government to lift import ban. Moreover, as was shown by Banse et al. (2019), scenario with no import ban for years 2017-2030 shows that milk production in Russia will decrease by average 0.8% annually.

As has been shown previously, there are significant differences among federal districts of Russia in terms of price and production changes after Russian import ban. Current study has attempted to show the direction of these differences. In comparison to many other neighboring countries, Russian Federation is the unique case of geographical and economic heterogeneity of the country. There is a definite opportunity for further studies of changes in individual members of each federal districts, to deepen current state of knowledge on import ban effects.

As in many cases during 20th century, economic sanctions have not achieved its purpose, but rather had less expected externalities. Instead of influencing on international policy of Russia, it has evoked import ban and has led to increased transfers to Russian dairy producers through market price support, rather than through subsidies. Therefore, it is difficult to consider that

Russian import ban will be lifted soon, as there is little economic incentive for a decision maker to do so.

Dairy and milk market were quite different in federal districts of Russian Federation since the beginning of the 1990s and it has undergone significant changes after introduction of Russian import ban in August 2014. From the statistical standpoint, it is possible to reject the null hypothesis of equal mean for production volume in most of the pairs of federal districts. However, in the case of producer prices the null of equal means cannot be rejected for most of the region pairs. This suggests significant differences in production volumes, but similar tendencies in producer prices. The only exception in this finding is Far Eastern Federal District, for which the null of equal means can be rejected in pairs with Volga, Ural, and Siberian. Far Eastern district is unique in many aspects, as can be seen from prices, production volumes and TPC data, and seems to become more disconnected from the rest of the country.

Recalculation of federal CSE estimation to regional level demonstrates that in case of import ban of Russian Federation aggregate data might not show detailed and complete picture of the policy effect. Due to significant differences between regions, there is an evidence of different pace of changes after in the period after 2014. Nevertheless, almost all the regions experienced the increase in transfers to producers from consumers due to increase in producers' price, while reference price did not experience the changes in the same pace. This led to the situation in which the negative TPC in 2013 was replaced by the positive TPCs in all the regions in 2014-2016 which effectively means increase in support of producers by consumers. Producers received the unique opportunity to charge consumers with higher prices, as competition has been lowered by import ban. From this perspective, producers of milk might be considered as net beneficiaries of import ban. In terms of milk and dairy products, the results also suggest that cost of the ban is being carried by consumers.

Unique opportunity for dairy producers in Russia has been used to increase production capacity, reflected by growth of milk production after 2017. Import ban has strengthen dairy industry in Russia, while consumers paid the support for agricultural producers instead of state budget. Share of support related to commodity output, including market price support due to higher prices, has grown, and has put agricultural producers into the position of lower dependency on subsidies.

Results of the study show, that currently Russian Government has little incentive to lift import ban for milk and dairy products, as Russian consumers has shown willingness to pay for the dairy products at higher prices. This might not be a voluntary decision; however, it has formed new equilibrium on milk market.

The changes in transfers between producers and consumers constitute clear evidence of import ban effect on milk market in Russia. The format of market was changed by the import ban and the state was not reversed to the previous equilibrium but rather formed a new one. It is a fact that the introduction of Russian import ban was expected to increase self-sufficiency of Russia in terms of food which is largely discussed and accepted in current research literature (see e.g., Wegren et al. (2017) or Wegren et al. (2016)). The increased transfers to producers from consumers of milk show more evident monetary part of the cost of self-sufficiency.

6 Russian import ban and regional trading blocs

6.1 Agrarian trade competitiveness of EAEU and EU after Russian import ban

Due to the presence of Russian import ban, it is important to analyse trade developments between EAEU countries and Russia and compare it with trade developments between EU and Russia; determine the changes in trade competitiveness and specialization for EAEU and EU countries towards Russia before and after Russian import ban. Findings should help to answer the question of whether trade specialization of EAEU countries in selected products has risen after Russian import ban in comparison to EU countries. Changes in agrarian trade competitiveness can be assessed on the dataset, which contains annual data for import and export to Russia for period 2000-2019 for countries of EAEU (Armenia, Belarus, Kazakhstan, Kyrgyz Republic) and for EU28 group, while analysis is done on the level of product groups within HS01-HS24 groups.

Trade competitiveness of EAEU countries, as assessed by Lafay index, had positive dynamics for dairy products, but decreasing trend for meat, as shown on Figure 6.1.

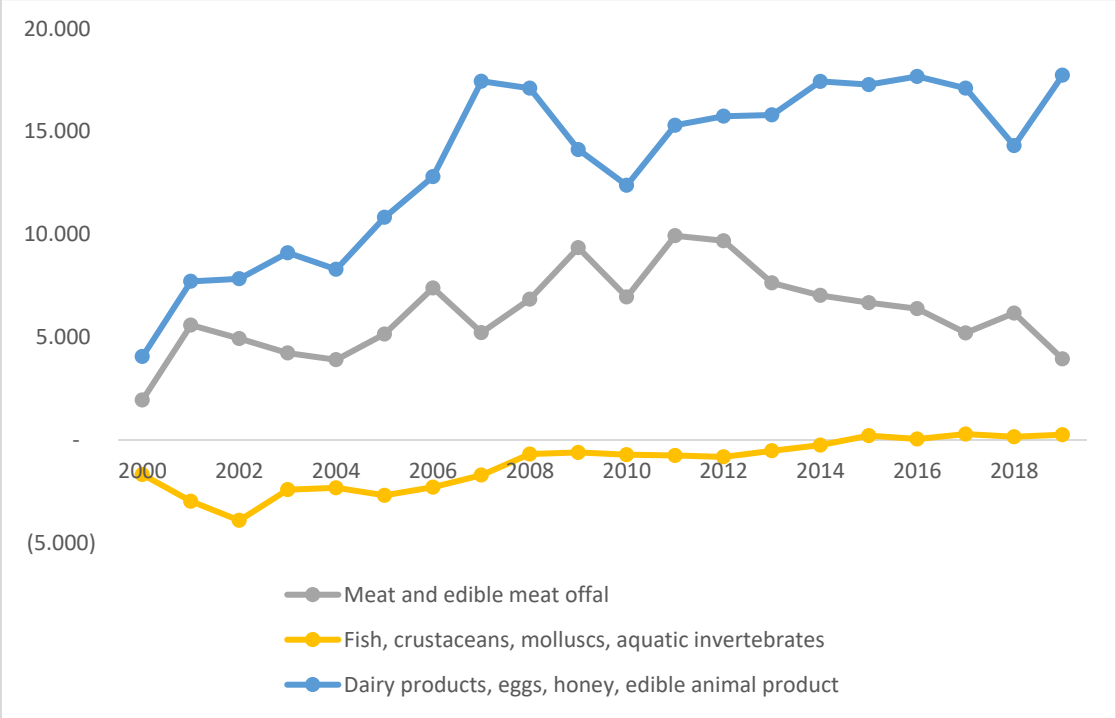

Figure 6.1 Main changes in Lafay index of EAEU countries.

Source: UN COMTRADE, 2021, author's calculations.

During last 20 years, trade competitiveness of EAEU countries in dairy products has been rising from 2000 to 2008, but after the Global Financial Crisis the trend has been reversed to downward. Year 2011 has shown recovery, but trade competitiveness has not improved until Russian import ban was introduced in 2014. The ban has given additional momentum, but the effect seems to be only short-term. Trade specialization in meat products copied the dynamics of dairy products during 2000-2011, had opposite trend in the period after 2011. Import ban had no positive effect on trade specialization of EAEU countries in meat products.

One of the most remarkable changes is the change in EAEU trade competitiveness for fish and crustaceans. Until import ban was introduced, EAEU countries had negative Lafay index, which points out to the absence of trade specialization in these product categories due to prevalence of imports over exports. Negative values of Lafay index would be expected for these countries, as none of them has access to the sea and stable fish processing industry. Nevertheless, trade specialization of these countries has been shifted after 2014 to positive values and have been fluctuating in the positive territory since then. As there were no major changes related to access to the sea for these countries, these changes can be associated with re-export of banned products via these countries. Concerns about these effects have been already raised in the literature (Liefert and Liefert, 2015) and questions about how such practices impact trade in EAEU region are still open (Romashkin et al., 2020). Design of this study does not allow to distinguish between the countries, however some of the evidence has been presented in the literature already (Belova, 2017).

Overall trade competitiveness and trade specialization can be assessed by estimating regressions for distributions of Lafay indexes. Results for EU countries are shown in the Table 6.1.

Table 6.1 Results of regression estimation for Lafay indexes, HS01-HS24 product groups for EU countries (2010-2019).

	Year									
Coef.	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
β_i	0.905***	1.053***	1.115***	0.846***	0.800***	0.981***	0.967***	0.911***	1.024***	1.016***
Std. error	(0.033)	(0.060)	(0.059)	(0.054)	(0.074)	(0.056)	(0.034)	(0.043)	(0.056)	(0.054)
α_i	0.000	0.000	-0.000	-0.000	0.000	-0.000	0.000	0.000	-0.000	-0.000
Std. error	(0.079)	(0.131)	(0.141)	(0.149)	(0.180)	(0.118)	(0.073)	(0.090)	(0.110)	(0.113)
R^2	0.971	0.933	0.941	0.917	0.841	0.934	0.974	0.954	0.938	0.941

Residual Std. Error (df = 22)	0.387	0.644	0.693	0.728	0.880	0.578	0.356	0.440	0.539	0.553
F Statistic (df = 1; 22)	745.031***	307.547***	353.468***	243.359***	116.305***	309.243***	815.178***	454.283***	333.258***	348.314***

*Source: UN COMTRADE, 2021, author's calculations. Note: *p<0.1; **p<0.05; ***p<0.01. Standard errors in parentheses.*

Trade specialization of EU countries towards Russia was steadily growing in 2010-2012, where estimated coefficient has been growing from 0.905 to 1.115. This shows the prevalence of food exports from EU towards Russia during these years. Year 2013 has shown the effect of regression towards mean, when the estimated coefficient was equal to 0.846. Interestingly, import ban was not introduced in this year, however relative weight of food exports from EU to Russia has started to decline already. Next year will show even deeper decrease in EU food exports to Russia, and coefficient dropped to 0.800 as a result. Based on the specification of the model, this means that EU had decreasing specialization in the products where it already had lower trade competitiveness and increasing specialization in the products where EU already had higher trade competitiveness. After import ban of 2014, EU started to increase its trade competitiveness only in 2018, when the coefficient has achieved value of 1.024.

Results for EAEU countries are shown in the Table 6.2. Trade competitiveness of EAEU countries have shown better dynamics in comparison to EU countries. Thus, coefficient for EAEU countries is higher than for EU countries in 8 years out of 10. Highest value of the coefficient was achieved in 2011, which was the recovery effect after Great Recession. In 2014, EAEU countries has increased trade competitiveness, while EU countries have shown opposite dynamics. In the years after introduction of Russian import ban, EAEU countries has shown better dynamics of trade competitiveness in comparison to EU. To some extent, this can be explained by substitution of EU imports to Russia by imports from within EAEU, however the magnitude of this was relatively low, as coefficient was lower than 1.

Table 6.2 Results of regression estimation for Lafay indexes, HS01-HS24 product groups for EAEU countries (2010-2019).

	Year									
Coef.	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
β_i	0.823***	1.275***	1.026***	0.944***	1.045***	0.990***	0.999***	0.952***	0.874***	1.104***
Std. error	(0.015)	(0.034)	(0.034)	(0.038)	(0.030)	(0.024)	(0.023)	(0.030)	(0.031)	(0.046)
α_i	-0.000	-0.000	0.000	-0.000	-0.000	0.000	0.000	-0.000	0.000	-0.000
Std. error	(0.061)	(0.110)	(0.142)	(0.163)	(0.124)	(0.107)	(0.099)	(0.130)	(0.132)	(0.172)
R^2	0.992	0.985	0.976	0.966	0.982	0.987	0.989	0.979	0.973	0.963
Residual Std. Error (df = 22)	0.297	0.537	0.697	0.798	0.610	0.524	0.487	0.636	0.646	0.845
F Statistic (df = 1; 22)	2,848.264***	1,428.650***	907.932***	632.053***	1,223.831***	1,654.997***	1,931.681***	1,039.338***	785.804***	575.433***

*Source: UN COMTRADE, 2021, author's calculations. Note: *p<0.1; **p<0.05; ***p<0.01. Standard errors in parentheses*

Such slow dynamics of EAEU trade competitiveness increase after Russian import ban allows to conclude, that EAEU countries had better relative position in the region than EU, however Russian import ban did not cause explosive growth in food exports from EAEU to Russia. Re-export can be considered as one of the factors supporting increase in EAEU trade competitiveness in this period (Romashkin et al., 2020), however its effect seems to be relatively small. Nevertheless, EAEU had better dynamics in trade competitiveness then EU during period of 2010-2019.

Trade competitiveness of EAEU group has undergone several changes after Russian import ban. EAEU countries has shown increasing trade competitiveness in dairy products, declining in meat products, and positive dynamics in fish and crustaceans (which might be an indication of re-export of banned products). However, overall trade competitiveness has shown mixed picture.

Comparing dynamics of EU and EAEU, it is possible to determine several periods of their trade relations with Russia. For EU these are expansion (2010-2012), deceleration (2013-2017), new momentum (2018-2019). For EAEU these are expansion (2010-2012), consolidation (2013-2018), new momentum (2019). EAEU has shown better magnitude of changes in trade

competitiveness, however it took longer for these countries to improve its positions in trade with Russia. These results might indicate signs of missing convergence between EAEU economies, including Russia, and higher rigidity of these economies to changes in supply and demand balance of regional trade. In other words, it seems that EAEU countries did not compensate falling exports from EU to Russia because of import ban.

Going forward, additional insight into the topic of EAEU trade developments can be gained by analysis of trade competitiveness on the level of EAEU member countries, including Russia, and comparing this trade bloc to similar in other regions, such as NAFTA, where USA (similarly to Russia in EAEU) has significantly bigger market than other members.

6.2 Substitution of foodstuff import flows within EAEU under Russian import ban

Based on the specification of the empirical model, current analysis attempts to accept or reject following hypothesis: participation in EAEU increases export trade flows from participating country to Russia for the products in scope of Russian import ban. Hypothesis is tested on the level of product groups. Hypothesis should be accepted if estimated regression coefficients of dummy variable $EAEU^j$ is statistically significant.

Results of models' estimation show mixed picture for different product groups. Table 6.3 reports results of model estimation for products in scope of Russian import ban. For all product groups, except HS02 (Meat and edible meat offal), there is a clear evidence of positive influence of Russian GDP and GDP of partner on trade flows, as model coefficients are statistically significant. At the same time, coefficients are positive, pointing out to positive trade elasticity of GDP. Highest trade elasticities are reported for HS01, HS07 and HS08, which is not unexpected, as latter two groups represent products which are traditionally imported to Russia.

Estimates for distance show little connection to export flows from the countries in dataset to Russia. In general terms, this might be an evidence of smaller trade costs associated with such trade. Decrease in significance of distance in international trade has been under discussion in trade literature (Coe et al., 2007; Disdier and Head, 2008), and is also connected to so-called "distance puzzle", or in other words persisting significance of distance variables in empirical studies, while theoretical framework would suggest that it should decline when trade is globalizing. One of the solutions of the distance puzzle has been proposed by Yotov (2012). Our findings support the theory and shows the absence of distance puzzle.

In connection to the distance variable, it is important to compare it with variable for common border. Common border is important for 6 product groups in scope of Russian import ban (HS01, HS02, HS03, HS04, HS07, HS08). Not surprisingly, highest elasticities are estimated for vegetables (HS07) and fruits (HS08), which are perishable products, and therefore customs clearance and rapid logistics chains are critical for such products. It is possible to conclude, that presence of common border is more important than distance. This might be also an evidence of regionalization of trade, and it will be very important to compare this with estimates for EAEU participation variable.

Common language, common history and presence of seaport do not show any significant influence of export of banned products to Russia.

Table 6.3 Results of gravity model estimation for product groups in scope of Russian import ban. Numbered columns represent models for HS product groups.

Independent variables	***Dependent variable***								
	ln Export								
	01	02	03	04	07	08	16	19	21
ln GDP Russia	3.804***	0.117	0.804	2.971***	3.636***	3.876***	1.437***	1.767***	2.285***
	(0.444)	(0.638)	(0.515)	(0.504)	(0.433)	(0.537)	(0.504)	(0.338)	(0.323)
ln GDP of partner	0.927***	1.312***	0.483*	1.102***	1.034***	1.157***	0.931***	1.672***	1.367***
	(0.318)	(0.344)	(0.253)	(0.282)	(0.308)	(0.352)	(0.318)	(0.210)	(0.231)
ln Distance	-1.978	-1.282	-1.968**	-1.740*	0.989	1.896	-1.587	-1.059	-2.143**
	(1.203)	(1.230)	(0.896)	(1.013)	(1.166)	(1.304)	(1.169)	(0.769)	(0.878)
Border	3.835**	4.465**	3.379**	2.795*	6.288***	5.385***	1.974	1.387	-0.849
	(1.905)	(1.949)	(1.421)	(1.604)	(1.846)	(2.065)	(1.852)	(1.218)	(1.390)
Language	-0.812	-2.080	1.347	1.260	-0.142	0.651	1.178	1.926*	1.944
	(1.762)	(1.808)	(1.318)	(1.488)	(1.708)	(1.913)	(1.716)	(1.129)	(1.285)
History	-1.876	-1.121	-5.129***	-1.925	-0.584	-0.107	-0.560	-0.293	-0.877
	(1.750)	(1.787)	(1.301)	(1.471)	(1.696)	(1.896)	(1.700)	(1.118)	(1.277)
Sea Port	-2.947**	-1.684	0.586	-2.880***	-2.262*	-0.730	-1.596	-0.476	-0.977
	(1.242)	(1.271)	(0.926)	(1.046)	(1.203)	(1.346)	(1.207)	(0.794)	(0.906)
Ban	**-1.055*** **	**-4.402*** **	**-3.660*** **	**-2.064*** **	**-2.973*** **	**-4.116*** **	**-1.879*** **	-0.056	**-0.579*** **
	(0.179)	**(0.267)**	**(0.218)**	**(0.211)**	**(0.174)**	**(0.219)**	**(0.207)**	(0.139)	**(0.130)**
EAEU	-0.526	-0.253	**1.002****	-0.246	**-0.704***	**-1.119****	-0.372	**-0.872*** **	-0.222
	(0.411)	(0.605)	**(0.491)**	(0.477)	**(0.401)**	**(0.501)**	(0.472)	**(0.317)**	(0.298)
Constant	-46.164***	0.204	3.402	-35.461***	-67.420***	-79.892***	-14.351	-32.418***	-26.500***
	(11.323)	(13.348)	(10.282)	(10.769)	(10.994)	(12.758)	(11.649)	(7.727)	(8.246)
Observations	640	640	640	640	640	640	640	640	640
R^2	0.192	0.378	0.399	0.183	0.338	0.370	0.140	0.234	0.214
Adjusted R^2	0.180	0.369	0.390	0.172	0.328	0.361	0.128	0.223	0.203
F Statistic	149.396***	382.130***	417.784***	141.487***	321.023***	370.579***	102.712***	192.507***	171.814***

*Source: EU COMTRADE, 2021, author's calculations. Note: *p<0.1; **p<0.05; ***p<0.01. Standard errors in parentheses.*

Most interestingly, coefficients for the EAEU participation are negative, and only coefficients for cereals (HS19) are statistically significant at 0.01-level, vegetables (HS07) and fruits (HS08) at 0.05-level, and fish and crustaceans (HS03) at 0.1-level. It is possible to make two main conclusions for these findings. Firstly, there is no clear evidence whether EAEU countries have substituted falling imports of products under the ban. It rather seems that these imports were compensated by Russia from outside of the EAEU bloc of countries. Based on the obtained estimates, participation in EAEU is not associated with increase in exports to Russia. Secondly, as

coefficients are negative, participation in the EAEU do not automatically increase export flows in selected product groups (products in scope of import ban). Both conclusions allow to reject the hypothesis stated above and conclude, that there is no evidence that participation in EAEU increases export trade flows from participating country to Russia for the products in scope of Russian import ban. In general, this is an unexpected result, as several authors have pointed out that usually trade unions have positive effect on international trade (Seyoum and Ramirez, 2012; Hart et.al., 2015), especially for small countries.

Estimation of the same model for products out of scope of the ban might give an interesting comparison of EAEU participation effect. Table 6.4 reports results of gravity model estimation for selected products which are out of scope of the ban. As expected, estimates for ban variable are not significant at 0.01-level for most of these products, with exception of trees and flowers (HS06), gums, resins, and vegetable saps (HS13) and beverages (HS22).

Table 6.4 Results of gravity model estimation for selected product groups out of scope of Russian import ban. Numbered columns represent models for HS product groups.

Independent variables	***Dependent variable***								
	ln Export								
	06	10	12	13	14	17	18	22	24
ln GDP Russia	1.500***	0.326	3.173***	-0.824**	0.686**	-0.053	1.049***	2.437***	-0.700
	(0.460)	(0.524)	(0.425)	(0.356)	(0.276)	(0.359)	(0.391)	(0.331)	(0.490)
ln GDP of partner	0.823**	1.115***	1.207***	1.502***	0.341**	1.422***	1.507***	1.089***	1.298***
	(0.338)	(0.287)	(0.316)	(0.254)	(0.139)	(0.220)	(0.250)	(0.246)	(0.297)
ln Distance	-1.034	0.892	0.099	-1.726*	0.297	-0.100	-2.888***	-1.576*	0.022
	(1.292)	(1.029)	(1.211)	(0.962)	(0.492)	(0.804)	(0.918)	(0.944)	(1.083)
Border	4.524**	5.238***	2.886	1.417	2.477***	3.361***	2.095	0.387	0.111
	(2.045)	(1.630)	(1.917)	(1.523)	(0.779)	(1.274)	(1.454)	(1.494)	(1.715)
Language	0.483	-5.224***	-0.481	2.682*	0.646	0.698	0.930	2.160	2.014
	(1.890)	(1.512)	(1.772)	(1.409)	(0.723)	(1.181)	(1.347)	(1.381)	(1.590)
History	-2.577	4.792***	0.665	-4.243***	-0.751	0.529	-1.815	-1.529	-1.024
	(1.879)	(1.494)	(1.762)	(1.399)	(0.714)	(1.169)	(1.334)	(1.373)	(1.574)
Sea Port	-1.837	-1.006	-1.229	-1.700*	-0.344	-1.284	-1.215	-0.898	0.233
	(1.333)	(1.063)	(1.250)	(0.993)	(0.508)	(0.831)	(0.948)	(0.974)	(1.119)
Ban	**-0.595*** **	-0.154	0.062	**0.310** **	-0.063	0.001	0.092	**-0.681*** **	-0.213
	(0.184)	(0.219)	(0.169)	**(0.143)**	(0.116)	(0.148)	(0.161)	**(0.132)**	(0.203)
EAEU	**2.014*** **	**-0.966***	**-1.160*** **	**-1.104*** **	**-1.513*** **	**-0.603***	**1.747*** **	-0.280	**-2.597*** **
	(0.424)	**(0.496)**	**(0.391)**	**(0.329)**	**(0.262)**	**(0.337)**	**(0.366)**	(0.305)	**(0.461)**
Constant	-19.057	-21.478*	-56.921***	12.913	-15.648***	-9.938	-5.579	-29.218***	-0.217
	(12.012)	(11.064)	(11.210)	(9.057)	(5.562)	(8.134)	(9.105)	(8.735)	(11.018)
Observations	640	640	640	640	640	640	640	640	640

R^2	0.132	0.073	0.222	0.096	0.088	0.102	0.227	0.186	0.072
Adjusted R^2	0.120	0.060	0.211	0.083	0.075	0.089	0.216	0.175	0.058
F Statistic	96.046***	49.832***	179.744***	67.074***	60.965***	71.548***	185.277***	144.085***	48.696***

*Source: EU COMTRADE, 2021, author's calculations. Note: *p<0.1; **p<0.05; ***p<0.01. Standard errors in parentheses.*

EAEU participation variable is statistically significant at 0.01-level only for trees (HS06), oil seed (HS12), gums, resins, and vegetable saps (HS13), vegetable products (HS14), cocoa and cocoa preparations (HS18) and tobacco products (HS24). Only in case of trees, flowers, and cocoa the coefficients are positive. In line with results for products in scope of import ban, there is mixed evidence that EAEU participation has helped respective countries to increase export of food products to Russia. Positive effect of EAEU participation is present for few product groups (trees and cocoa and cocoa preparations), while for the majority of product groups positive effect is not present.

In general, EAEU countries do not seem to be the winners of Russian import ban. Russia is the biggest economy in the EAEU bloc by all measures, and it would be natural to expect increase in exports from EAEU countries towards Russia as a result of import ban. Counterintuitively, participation in trade bloc has not automatically allowed member states to enjoy higher trade flows with Russia and use the opportunities of import ban. Results of modelling shows no effect of EAEU participation in product groups in scope of import ban, however positive effect is present in two product groups, which are out of ban scope. In general terms, EAEU countries did not substituted falling import flows after the import ban introduction, and these trade flows were substituted from outside of the trade bloc.

It should be noted that gravity models used in current research might be subject to omitted variables' bias, and therefore obtained results might give an evidence of the fact, that other factors have influence on trade flows within EAEU bloc. However, based on current results, it is possible to conclude, that EAEU trade agreements might be revisited and re-negotiated in future, in order to allow member states to receive more benefits from the trade with Russia.

Here, it seems also important to consider changes in trade competitiveness of EAEU member states in selected products after introduction of Russian import ban. Current results suggest that these countries did not increase competitiveness towards Russia, however specific analysis as per country might bring additional insight into the topic.

7 Trade effects of Russian import ban

7.1 Distribution of Russian import ban impact

While the introduction of a foodstuff import ban as a reaction to individual and sectoral sanctions might be seen as an inadequate response, it is important to look at the context of the events of 2014 and the position of both sides. Western sanctions against Russia have been partially targeted at entities involved in the Ukrainian events of 2014, and have partially had a broader character, such as a ban on the long-term financing of top Russian state-owned banks by Western financial institutions. By applying economic sanctions, Western countries attempted to change the behaviour of Russia, and therefore used economic coercion in a balanced way, in order to apply pressure that would not have too strong an effect on their own economies and would be just enough to convince Russia. Due to the specifics of the Russian economy, this economic pressure has been noticeable; however, it is not decisive. According to some estimates, depreciation of the national currency (ruble) due to decreased oil prices on world markets had an impact on GDP growth up to three times higher (Gurvich and Prilepskiy, 2015). The European Union was one of the main exporters of foodstuff products to Russia in 2014, so im-ports from the EU were a sensitive target for Russian countermeasures.

Some researchers connect the topic of the Russian import ban with the topic of food security. However, in terms of Russian countermeasures, it is possible to consider the topic of food independence. As mentioned by Wegren et al. (2017), Russian authorities have a specific understanding of food security. From their perspective, a country that is dependent on the import of food can be considered vulnerable. Trading partners with the largest import shares may exercise force on the counterparty to enforce policies of interest or change the modus operandi of the partner. In the case of EU-Russia agricultural trade, the EU can be considered as such a trading partner.

There are three main reasons for the dominant position of the EU on the Russian market. The first reason is geographical: Russia has a land border with five EU member countries, namely Finland, Estonia, Latvia, Lithuania, and Poland. The second reason is historical: contemporary Russia is a descendent of the Soviet Union, one of the largest trade partners of the EU. The third reason is fully practical: the EU is one of the largest food producers and exporters in the world.

The long-term unwillingness of Russian authorities to be in a vulnerable position relative to the dominant trading partner was established by the Russian Food Security Doctrine of 2010 (President of the Russian Federation, 2010) and re-enforced by the Food Security Doctrine of 2020 (President of the Russian Federation, 2020). Both editions of the Doctrine set the levels of self-sufficiency in the production of, among other things, meat, milk, fish, potatoes, vegetables, and fruits at the 80% to 95% level.

It is important not to forget the protectionist nature of any import ban. Since Russia joined the World Trade Organization in 2012, the country has pledged to comply with the rules and principles of the organization. A protectionist policy would not conform to WTO principles; however, the WTO was not able to force Russia to lift the ban, because it can be classified as a security concern. Comparing the timing of the import ban and the Russian Food Security Doctrine makes one think that the introduction of the ban could be just an example of the good use of circumstances to enforce a protectionist policy.

One unique feature of the EU-Russia economic sanctions case is that this is a confrontation between a country and a group of countries, represented by a supranational institution. The imposition of restrictive measures was done under the Common Foreign and Security Policy, under which the European Council (which consists of the heads of state or governments of all 28 member states) has a right to introduce such measures on behalf of the Union (Council of the European Union, 2014). From this perspective, this economic confrontation consists of Russia on one side and the EU28 countries on the other. Due to the significant heterogeneity among European economies, it is probable that the impact of the Russian import ban on trade would be different for each member state. To the best of the author's knowledge, the existing literature covers the discussion about the level of uniformity of the Russian import ban impact distribution on the EU28 countries only to a limited extent.

The current chapter attempts to assess the impact of the Russian import ban on trade between the EU28 countries and Russia. As part of the analysis, the chapter attempts to categorize the EU28 countries in accordance with the impact of the ban using a cluster analysis framework. Furthermore, changes in trade shares and a scenario assessment are made in order to capture the impact on individual countries. Scenario estimation was chosen to reflect the complexity of the topic and because a wide range of assumptions need to be made. While some of these assumptions

can be challenged, it is fair to admit that the estimations presented in this chapter can provide an insight into the trade and economic impacts of the ban for both parties. Scenario estimation is then used to estimate the possible GDP effect of the Russian import ban due to changes in the trade balance of the EU28 countries.

This chapter attempts to describe the distribution of the Russian import ban impact among the EU28 countries through the lenses of trade in both sanctioned and non-sanctioned product categories. To do this, the chapter analyses the market shares and clustering of the EU28 countries in accordance with the trade flows with Russia before and after the introduction of the import ban and determine the level of the import ban impact as per optimistic and pessimistic scenarios. Chapter argues that although the Russian import ban was introduced as a countermeasure to Western sectoral and individual sanctions, the ban's impact on EU28 economies is not parallel, and the impact is not evenly distributed among EU members.

Based on the results, it is possible to argue that during the period of 2009–2019, the grouping of EU28 countries with respect to the trade balance with Russia has changed, and part of this effect can be attributed to the import ban. The estimation shows that the import ban had a greater impact than has previously been assessed in the literature on the topic. Unlike some of the existing works on the topic, the results show that Germany, the Netherlands, Lithuania, and Poland are the countries which experienced the largest impact from the Russian import ban.

As mentioned in previous chapters, the Russian import ban of 2014 was introduced as a countermeasure to Western economic sanctions imposed in the same year against Russia. Multilateral economic sanctions have been under the scrutiny of different authors for decades. One of the first reviews of economic sanctions was produced by Galtung (1967), where the author investigated the case of Rhodesia under international economic sanctions. Among other considerations, the author points out that it is naïve logic to think that comprehensive economic sanctions will cause economic damage to the target country, and therefore change its behaviour. Another important work on the topic of economic sanctions is the book *Economic Sanctions Reconsidered: History and Current Policy* (Hufbauer et al., 1990). The authors investigated 116 cases of economic sanctions, mostly imposed by the US, but also by other countries. Based on the analysis, the authors concluded that only around 34% of cases achieved their goals. While the methodology and data used in the study were later criticized (for example, by Pape, 1997), a

discussion of whether comprehensive economic sanctions are an effective measure in international politics began. In part, it led to the introduction of so-called "smart sanctions" (Cortright & Lopez, 2002; Veebel & Markus, 2015). These, unlike the previously widespread comprehensive economic sanctions, are intended to damage specified individuals or organizations. Along with the Russian import ban, the European sanctions against Russia introduced in 2014 fall into the category of targeted sanctions. A detailed summary of the background of the Western sanctions against Russia and the Russian import ban has been provided in the literature on this topic (Dreger et al., 2016; Crozet & Hinz, 2016; Moret et al., 2016). Western trade sanctions against Russia covered trade in military technology and specialized equipment for oil and gas extraction, while the Russian Federation imposed a ban on the import of foodstuffs from sanctioning countries.

More economic literature has emerged on the topic of the effectiveness of the EU-Russia sanctioning regime. In one of the recent works on the topic, Belin and Hanousek (2021) estimate the trade effects of Western sanctions and the Russian import ban using the differences-in-differences approach and concluded that Western sanctions had a very limited effect on the sanctioning and targeted economies, whereas the Russian import ban had a more significant effect. In line with previous studies on economic sanctions (Kaempfer & Lowenberg, 1988), the authors also conclude that governments in the sanctioning countries (Western countries) would design sanctioning policies so as to minimize the costs to domestic interest groups, while the targeted country's costs are likely to be substantially smaller, especially due to Russia's potential substitution of domestic producers.

Some authors point to the process of import substitution, which has been developing during the Russian import ban (see, for example, Deppermann et al., 2018), and therefore could have the potential to decrease the costs of the import ban for the Russian economy. Wengle notes that the domestic effects for the Russian economy vary by sub-sector, including increases in the production of pork and decreases in production for dairy, beef, and fish producers (Wengle, 2016).

According to the evidence, the self-sufficiency of the Russian economy has risen. At the same time, Asian trading partners have replaced Western ones, and there is a high likelihood that this balance will not change if the Russian import ban is lifted (Wegren & Elvestad, 2018). There is evidence of a reduction in the transaction costs between Russia and its main non-EU trade partners in the pork trade, and an increase in the transmission of price changes over the long term

(Djuric et al. 2015). Consumers could bear the largest burden of the import ban (Gohin, 2017; Krivko et al., 2019). Several other effects of Russian import ban, which were reported by different authors, were covered in the previous chapters (see, e.g., Liefert et al., 2019; Boulanger et al., 2016; Venkuviene & Masteikiene, 2015; Zdrahal et al., 2016; Nagy & Jambor, 2019; Fedoseeva & Herrmann, 2019).

The Russian import ban has been extended every year since 2014, which leads some researchers to consider whether the ban will be lifted in the foreseeable future. In one of the most recent works, it is argued that the Russian import ban, in contrast to the European Common Agricultural Policy, has effectively substituted monetary support to agricultural producers via the price channel, and, as this is beneficial for the state budget, there is little incentive for the Russian government to lift the ban anytime soon (Krivko & Smutka, 2020). Another consideration was proposed by Banse et al. (2019). The authors assessed several scenarios and concluded that removal of the Russian import ban would have no effect on EU agriculture, and a limited effect on Russian agriculture, while the creation of a free trade area between the EU and Russia would benefit European farmers more than Russian farmers.

Most of the studies related to the Russian import ban impact focus on the impacts on specific countries or country groups. However, the story of Western sectoral and individual restrictive measures (introduced in 2014 by several countries, including the EU28) and countermeasures (introduced by Russia) is complex. The declared motivation for the Western sanctions was to change the *modus operandi* of the Russian government; however, as shown previously (starting with Hufbauer et al., 1990), it is important to determine whether the imposed economic sanctions influenced the counterparty and helped to achieve the desired result. At the same time, the sanctions episode of 2014 can be characterized as a "many-to-one" sanctions game: with the group of EU28 countries on one side and Russia on the other. From this perspective, it is important to determine whether the impact of the Russian import ban is evenly distributed among the EU28 countries. This can help us to understand the effectiveness of the Russian import ban and to determine the prospects for changes in the ban regime, or even the economic prospects of Russia lifting the ban.

To the best of the authors' knowledge, the existing literature on the topic of the Russian import ban does not provide answers to the questions raised above; the current study therefore

attempts to address these issues. Using trade data for the EU28 and Russia for the period before and after introduction of the import ban, this chapter attempts to group the EU28 countries in accordance with their agri-food trade connections with Russia, define the impact of the ban in terms of trade changes and identify the EU28 countries with the most significant ban impacts. Based on this data, the chapter attempts to contribute to the ongoing discussion about whether the Russian import ban was an adequate and parallel response to the Western restrictive measures of 2014.

7.2 Assessment of Russian import ban impact uniformity

of the import ban impact among the EU28 countries through the lens of export loss or benefit. Estimation of the import ban impact distribution is done in order to accept or reject the following hypothesis: the Russian import ban impact can be characterized as parallel to the Western sectoral and individual restrictive measures of 2014 in terms of trade losses of the EU28 countries.

Cluster analysis of the EU28 countries, based on the values of the trade balance with Russia, has shown that in 2009, this group of countries could be split into two main groups, and each of these groups can then be sub-divided into several clusters. Results of the cluster analysis for the year 2009 based on Ward's method are shown in Figure 7.1. In general terms, the first group consists of countries which experienced higher percentage changes in trade balance but had relatively smaller values of trade with Russia, while the second group represents the largest EU exporters, which experienced a significant impact from the Russian import ban. Interestingly, except for Latvia (which increased its agri-food trade balance with Russia by 119% between 2009 and 2019), there was no movement between these groups in 2009 and 2019. Countries inside each group are shown in Table 7.1.

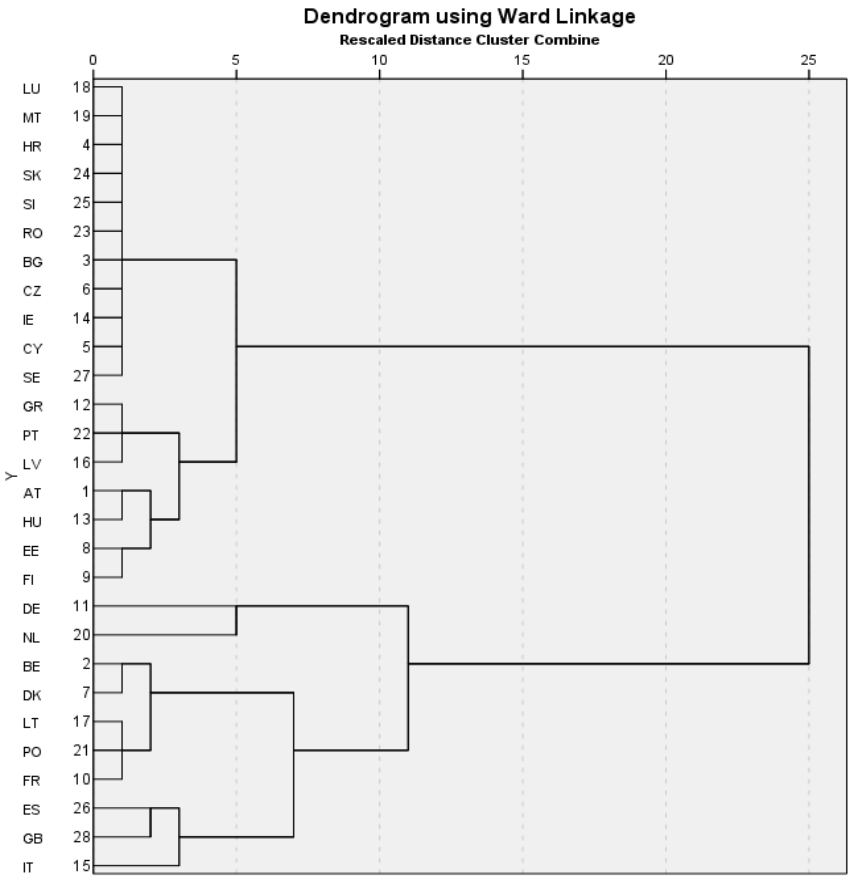

Figure 7.1 Cluster analysis of the EU28, based on the value of the trade balance with Russia, for the year 2009.

Source: UN COMTRADE, 2021, author's calculations.

Table 7.1 Grouping of the EU28 countries according to the agri-food trade balance in 2009 and 2019.

Group	2009	Agrifood Trade Balance with Russia in 2009, Average, International Dollars	2019	Agrifood Trade Balance with Russia in 2019, Average, International Dollars	% Change
Group 1	Austria, Bulgaria, Croatia, Cyprus, Czechia, Estonia, Finland, Greece, Hungary, Ireland, Latvia, Luxembourg,	87,325,208.50	Austria, Bulgaria, Croatia, Cyprus, Czechia, Estonia, Finland, Greece, Hungary, Ireland, Luxembourg,	67,182,209.67	−23.06%

	Malta, Portugal, Romania, Slovakia, Slovenia, Sweden		Portugal, Romania, Slovakia, Slovenia, Sweden		
Group 2	Belgium, Denmark, France, Germany, Italy, Lithuania, the Netherlands, Poland, Spain, United Kingdom	685,197,584.20	Belgium, Denmark, France, Germany, Italy, Latvia, Lithuania, the Netherlands, Poland, Spain, United Kingdom	353,653,565.20	−48.39%

Source: author's calculations.

As can be seen from Table 7.1, Group 1 consists of EU28 countries having a smaller agri-food trade balance with Russia, while Group 2 consists of countries with larger agri-food trade balances. The average GDP in Group 1 is also significantly lower than the average GDP in Group 2, for both years. At the same time, the percentage change in the average trade balance in Group 1 was significantly lower than in Group 2 (23.06% and 48.39%). The absolute decrease in Group 2 was also larger. From this perspective, countries in Group 2 experienced a greater import ban impact than countries in Group 1.

Several clusters of countries can be identified for the year 2009. The first cluster consists of a relatively large group of countries with a small trade balance value with Russia. All of these countries are relatively small, open economies, such as Luxembourg, Malta, Croatia, Slovakia, Slovenia, Romania, Bulgaria, the Czech Republic (Czechia), Ireland, Cyprus and Sweden. The trade balance in agri-food trade for these countries varied between negative 2.8 million USD (Cyprus) and positive 69.3 million USD (Czechia). There are several similarities among these countries. None of these countries share a common border with Russia. None of them was part of the Soviet Union (like Latvia, Estonia, and Lithuania), although some of these countries had close trade connections with the Soviet Union at some point in their history (examples include Romania, Bulgaria, Czechia and Slovakia). Except for Cyprus and Malta, which have a negative trade balance, the positive trade balances of these countries are driven by the prevalence of exports to Russia over imports from Russia; however, the absolute values of exports are smaller than for other countries in the EU28 group.

On average, countries in cluster 1 experienced a trade balance decrease of 109.1% in agri-food trade with Russia during 2009–2019. Interestingly, there is a mixed change in trade balances in cluster 1 countries. Some of them (Croatia, Czechia, Romania, Slovenia) showed an increase in their agri-food trade balance with Russia. Additionally, all cluster 1 countries remained in the same cluster in 2019 (Figure 7.2), except for Czechia (which moved into cluster 2) and Malta (which showed the largest change in percentage terms and was excluded from the analysis as an outlier).

The second cluster of countries in 2009 consists of Greece, Portugal, Latvia, Austria, Hungary, Estonia, and Finland. The average GDP in this cluster is higher than average GDP in cluster 1. Three countries have an increased agri-food trade balance with Russia: Austria (by 0.005% of 2019 GDP), Hungary (by 0.008% of 2019 GDP) and Latvia (by 0.615% of 2019 GDP). The largest loss of trade in relation to GDP is registered for Estonia, which lost a value of trade equivalent to 0.431% of 2019 GDP between 2009 and 2019.Clusters 3 and 4 are composed of Germany and the Netherlands, respectively. These two countries have the largest positive value of agri-food trade balance with Russia; however, in the period of 2009–2019, the trade balance decreased by 51.45% in the case of Germany and by 31.39% in the case of the Netherlands. Both countries were still the largest players in agri-food trade with Russia in 2019. After the introduction of the import ban, these countries lost a significant portion of their trade; however, as will be seen, their shares in EU28 agri-food trade with Russia have increased.

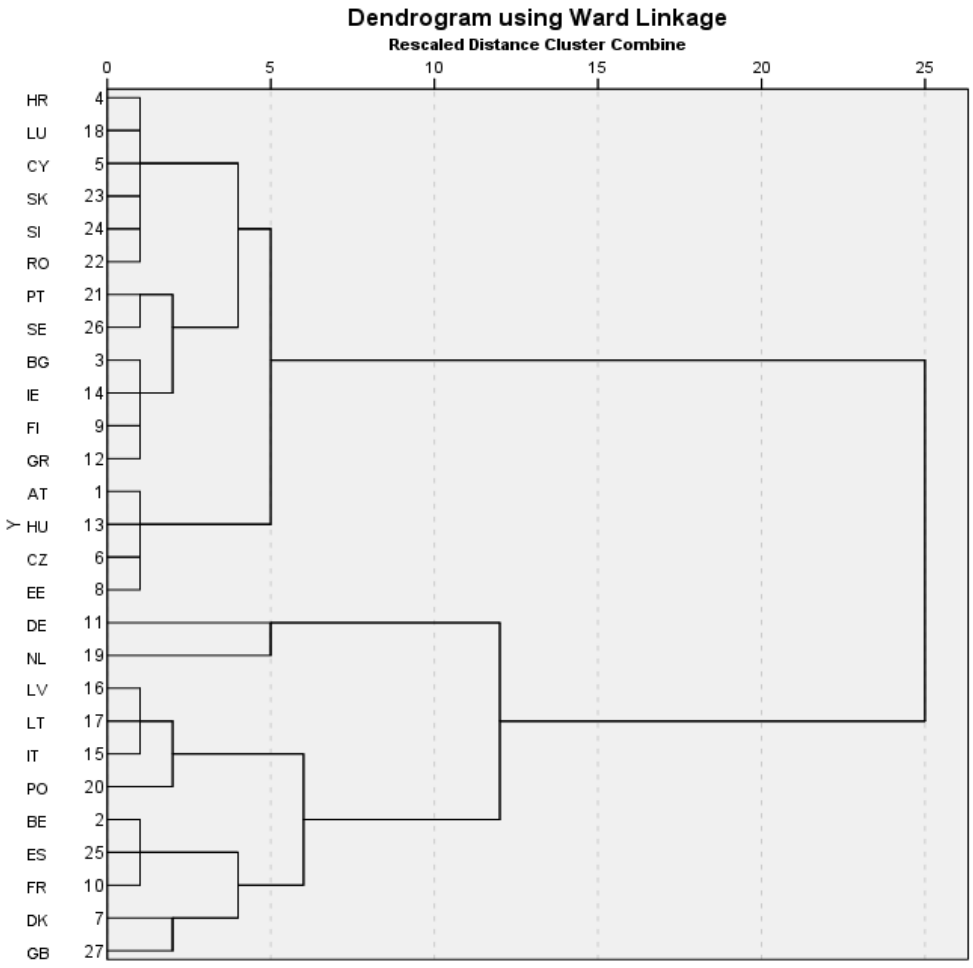

Figure 7.2 Cluster analysis of the EU28, based on the value of the trade balance with Russia, for the year 2019.

Source: UN COMTRADE, 2021, author's calculations.

An interesting picture of changes in the grouping of EU countries can be seen in the smaller cluster distances. Six groups of countries can be defined after the introduction of the import ban, and each of the groups has special features when it comes to agri-food trade. Countries in the first group have a significant maritime shipping industry (Belgium, Spain, France, Denmark, and the UK). A common feature of the countries in the second group (Latvia, Lithuania, Italy, and Poland) is that a significant part of their agri-food trade with Russia was within the scope of the ban, while their agri-food trade balance with Russia was not the largest one. Considering the size of the economy of these countries, they can be considered the real bearers of the import ban impact. As will be shown later, these countries also have the largest share of EU28 trade losses due to the Russian import ban.

The third and fourth clusters consist of one country - the Netherlands and Germany, respectively - and can be called clusters of large players. These two countries had the largest values of agri-food trade with Russia before the ban, and their decreases in the agri-food trade balance were most dramatic in absolute values, but not in percentage terms. The fifth group of countries (Austria, Hungary, Czechia, and Estonia) experienced a significantly smaller impact on agri-food trade, and three of them (Austria, Hungary, and Czechia) managed to increase their share on the Russian agri-food market after the ban (as shown in Figure 7.3). The last, sixth group, consists of countries with relatively small changes in their agri-food trade balance with Russia.

The import ban has disrupted supply chains of agri-food exports from the EU to Russia, and one might expect several possible scenarios of changes in market shares in the sanctioned product categories for EU exporters. As the import ban covered several 4-digit product categories, as well as 6-digit product categories, changes in market shares at the 2-digit product level can be multidirectional. The market share of an EU exporter-country is thus dependent on total imports for the 2-digit category, level of import substitution for the given category by domestic production, and level of import substitution by other countries, mostly outside of the scope of the ban. Domestic import substitution has a decreasing effect on the market share of EU exporters, and some authors note the ongoing process of import substitution by domestic producers after the introduction of the import ban (Deppermann et al., 2018; Wengle, 2016). Substitution of import flows by countries outside of the scope of the ban is another important factor. Other authors also note that for some categories, Asian exporters have replaced Western ones on the Russian market (Wegren & Elvestad, 2018), and this new balance might be difficult to challenge in case the Russian import ban is lifted.

Changes in market share can lay the foundation for future developments in trade between EU countries and Russia. If the Russian import ban is lifted, it is fair to expect that countries with higher market shares would use this advantage to regain trade volumes and increase their trade balances with Russia. Table 7.2 reports changes in the shares of individual countries in EU28-Russian trade for sanctioned and non-sanctioned product categories. For all products, several countries managed to increase their share after the import ban. These countries are Austria (from 2.0% in 2013 to 3.3% in 2019), Bulgaria (from 0.5% to 1.0%), Czechia (from 0.8% to 2.1%), Germany (from 14.1% to 16.5%), Hungary (from 2.3% to 3.0%), Italy (from 5.9% to 8.9%), Latvia

(from 4.3% to 6.8%), the Netherlands (from 12.8% to 15.4%), Portugal (from 0.4% to 0.8%), Romania (from 0.4% to 0.8%), Slovenia (from 0.3% to 0.6%), Sweden (from 0.8% to 1.6%) and the United Kingdom (from 1.4% to 2.4%). The largest gain in market share (increase of 3%) was seen by Italy. Before the introduction of the import ban, Germany and the Netherlands held the largest shares in EU28 agri-food trade with Russia. Five years after the introduction of the ban, these two countries together still hold more than 31% of the share, and both countries managed to increase their share in overall agri-food categories, as well as in sanctioned products.

The largest decrease in trade share can be attributed to Lithuania (a 4% decline in the share in overall agri-food trade), followed by Denmark, with a 3.2% decline. The case of Denmark is especially remarkable, as the country experienced a 51.45% decline in their agri-food trade balance in 2009–2019.

Table 7.2 Shares of individual countries in EU28 agri-food trade with Russia.

Countries	Sanctioned products				Non-sanctioned products				All products		
	2013	2015	2019		2013	2015	2019		2013	2015	2019
Austria	2.2%	2.2%	3.1%	Up	1.7%	2.2%	3.3%	Up	2.0%	2.2%	3.3%
Belgium	4.4%	2.4%	3.2%	Down	2.2%	2.6%	3.3%	Up	3.6%	2.5%	3.2%
Bulgaria	0.2%	0.3%	0.6%	Up	0.9%	1.1%	1.2%	Up	0.5%	0.8%	1.0%
Croatia	0.2%	0.3%	0.2%	Stable	0.0%	0.2%	0.2%	Stable	0.1%	0.2%	0.2%
Cyprus	0.2%	0.0%	0.0%	Stable	0.0%	0.0%	0.0%	Stable	0.1%	0.0%	0.0%
Czechia	0.5%	1.8%	2.0%	Up	1.3%	1.6%	2.2%	Up	0.8%	1.6%	2.1%
Denmark	7.4%	5.0%	4.5%	Down	2.5%	1.5%	1.2%	Down	5.5%	2.6%	2.3%
Estonia	1.6%	1.9%	5.7%	Up	6.0%	5.9%	1.7%	Down	3.3%	4.6%	2.9%
Finland	4.5%	2.1%	1.6%	Down	2.4%	2.3%	1.4%	Down	3.7%	2.2%	1.5%
France	4.9%	4.0%	3.8%	Down	8.5%	7.1%	6.3%	Down	6.3%	6.1%	5.5%
Germany	13.4%	20.1%	20.6%	Up	15.4%	16.0%	14.7%	Down	14.1%	17.3%	16.5%
Greece	1.9%	0.3%	0.3%	Down	0.8%	1.0%	0.4%	Down	1.4%	0.7%	0.4%
Hungary	1.9%	3.2%	2.6%	Up	2.9%	3.5%	3.2%	Up	2.3%	3.4%	3.0%
Ireland	2.9%	2.0%	0.9%	Down	0.3%	0.4%	0.4%	Stable	1.9%	0.9%	0.5%
Italy	4.7%	6.4%	6.9%	Up	7.8%	7.3%	9.7%	Up	5.9%	7.0%	8.9%
Latvia	1.3%	1.3%	0.4%	Down	9.0%	8.1%	9.7%	Up	4.3%	5.8%	6.8%
Lithuania	13.9%	7.7%	4.8%	Down	8.5%	9.9%	9.1%	Up	11.8%	9.2%	7.8%
Luxembourg	0.1%	0.3%	0.0%	Stable	0.0%	0.0%	0.0%	Stable	0.1%	0.1%	0.0%
Malta	0.0%	0.0%	0.0%	Stable	0.0%	0.0%	0.0%	Stable	0.0%	0.0%	0.0%
Netherlands	11.2%	21.0%	18.2%	Up	15.3%	12.4%	14.1%	Down	12.8%	15.2%	15.4%
Poland	13.8%	7.7%	9.0%	Down	5.9%	7.4%	7.6%	Up	10.8%	7.5%	8.0%
Portugal	0.3%	0.6%	0.3%	Stable	0.6%	0.5%	1.0%	Up	0.4%	0.5%	0.8%
Romania	0.0%	0.1%	0.1%	Stable	0.9%	1.3%	1.2%	Up	0.4%	0.9%	0.8%
Slovakia	0.3%	0.7%	0.6%	Up	0.3%	0.1%	0.2%	Stable	0.3%	0.3%	0.4%
Slovenia	0.3%	1.0%	1.5%	Up	0.1%	0.1%	0.1%	Stable	0.3%	0.4%	0.6%
Spain	6.0%	3.2%	2.6%	Down	3.4%	5.2%	5.0%	Up	5.0%	4.5%	4.2%
Sweden	0.8%	2.5%	4.1%	Up	1.0%	0.5%	0.5%	Down	0.8%	1.2%	1.6%

United Kingdom	1.1%	2.1%	2.6%	Up	2.0%	2.0%	2.4%	Up	1.4%	2.1%	2.4%

Source: EU COMTRADE (2021), author's calculations.

An individual country's share in EU28-Russia trade could be important if the Russian import ban is lifted; however, has the ban stopped the banned countries from expanding their market share in non-banned categories? Figure 7.3 reports the changes in agri-food market share of the EU28 countries on the Russian market.

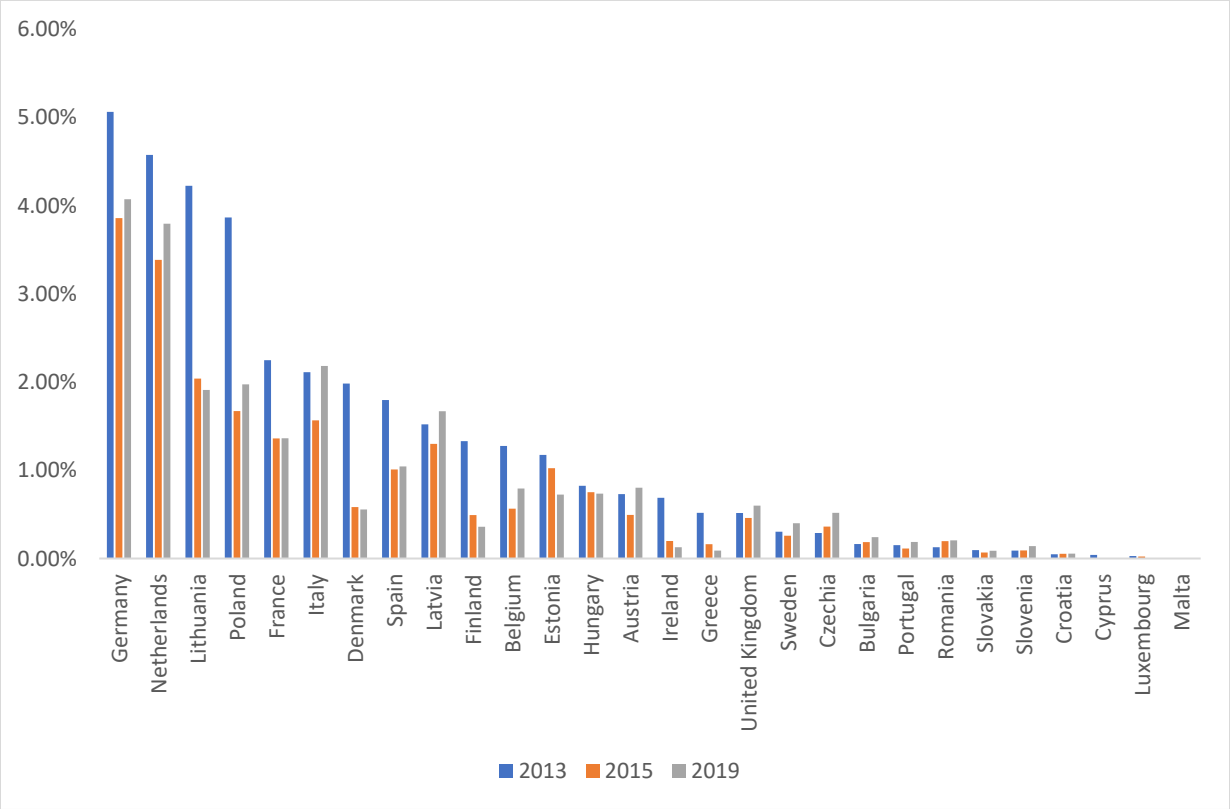

Figure 7.3 Shares of the EU28 countries in the agri-food imports of Russia.

Source: UN COMTRADE, 2021, author's calculations.

As shown in Figure 7.3, some countries have increased their share in the agri-food imports of Russia. Interestingly, sorted by import share before the ban, the countries in the lower part of the list are countries which increased their share of Russian agri-food imports, while the larger players, such as Germany and the Netherlands, have seen it reduced. At the same time, among the large players, Italy and Latvia experienced significant decreases in their shares immediately after introduction of the ban but increased their shares from 2.11% to 2.18% and from 1.52% to 1.62%, respectively, in 2013–2019. Similar cases of expansion despite the presence of the ban are evident

for the United Kingdom, Sweden, and Czechia. As can be concluded, some countries have not stopped expanding their market share on the Russian market, and thus could be the ones to see the first benefits once the ban is lifted.

Calculation of the cumulative impact of the Russian import ban (Table 7.3) shows that Germany, Lithuania, Poland, and the Netherlands experienced the largest losses in both scenarios. The losses for these countries are higher in the case of the pessimistic scenario. In fact, these three countries experienced the largest losses in both the optimistic and pessimistic scenarios. In the existing literature, Lithuania and Poland have been noted as the countries with the largest price decreases on the domestic market due to the Russian import ban (Boulanger et al., 2016). The current study complements these findings with the fact that conditions for Germany and the Netherlands were also challenging, and these countries experienced a serious impact from the ban. Not only have these countries lost the trade benefits they have already achieved, but the Russian import ban has also caused a loss in terms of an opportunity cost. It is possible to call this group of countries "the established players". Interestingly, Germany and the Netherlands increased their share of EU28 trade with Russia after the ban.

Table 7.3 Cumulative impact of the Russian import ban on agri-food trade of the EU28 with Russia for the period 2014–2019, in current USD (selected countries).

Country	Optimistic	Pessimistic	% Share in EU28 Loss		
			Share in 2013	Share in 2015	Share in 2019
Austria	**−655,631,861**	−1,453,770,364	2.04%	2.22%	3.26%
Belgium	−1,968,408,172	−1,992,102,665	3.56%	2.54%	3.22%
Bulgaria	−87,371,552	−163,476,826	0.46%	0.84%	0.98%
Croatia	−14,543,637	−81,019,681	0.14%	0.24%	0.22%
Cyprus	−94,754,927	−170,914,449	0.12%	0.01%	0.02%
Czechia	6,839,270	−462,848,718	0.81%	1.62%	2.10%
Denmark	**−3,856,508,395**	**−6,895,348,038**	5.54%	2.62%	2.26%
Estonia	−1,334,791,477	−2,830,113,075	3.28%	4.60%	2.94%
Finland	−2,420,167,772	−3,822,425,229	3.72%	2.21%	1.46%
France	−3,125,065,265	−4,894,619,560	6.28%	6.11%	5.53%
Germany	**−5,862,778,214**	**−7,398,142,705**	14.15%	17.32%	**16.53%**
Greece	−989,150,345	−2,414,243,277	1.45%	0.73%	0.36%
Hungary	−726,688,000	−2,176,206,365	2.30%	3.38%	2.98%
Ireland	−1,326,519,932	**−9,202,753,078**	1.92%	0.90%	0.52%
Italy	−1,919,115,589	**−7,013,932,214**	5.90%	7.03%	**8.86%**
Latvia	−1,099,572,875	**−8,780,190,659**	4.25%	5.84%	**6.78%**
Lithuania	**−6,766,020,361**	**−20,761,354,978**	11.81%	9.15%	**7.76%**
Luxembourg	−45,109,566	−51,465,360,484	0.08%	0.10%	0.00%
Malta	−156,038	−2454	0.00%	0.00%	0.00%

Netherlands	**−5,302,820,306**	**−8,460,532,856**	12.79%	15.19%	**15.40%**
Poland	**−6,247,839,785**	**−16,801,439,432**	10.80%	7.50%	**8.01%**
Portugal	−96,093,993	−772,186,139	0.42%	0.51%	0.76%
Romania	69,742,970	−1,478,618,984	0.36%	0.88%	0.84%
Slovakia	−114,917,324	−336,495,500	0.27%	0.30%	0.35%
Slovenia	−24,742,318	−155,389,813	0.25%	0.41%	0.57%
Spain	−2,629,868,169	−4,636,541,240	5.02%	4.53%	4.23%
Sweden	−173,195,293	−713,624,328	0.85%	1.16%	1.62%
United Kingdom	−415,970,868	−522,481,801	1.44%	2.07%	2.43%
Total	−47,221,219,794	−95,389,796,146	100.00%	100.00%	100.00%

Source: EU COMTRADE (2021), author's calculations.

Three other countries—Ireland, Italy, and Latvia—represent another case. The losses of these countries are significantly higher in the pessimistic scenario than in the optimistic scenario. These countries experienced opportunity cost losses, which are mainly because they had an optimistic dynamic in their trade balance with Russia before the ban and were expected to continue along the same trajectory if the import ban had not been introduced. Ireland, Italy, and Latvia can be called "rising stars" in agri-food trade with Russia; however, their ascent was stopped by the ban.

An important view of the import ban impact can be achieved by looking into the shares of individual countries in the total EU28 losses due to the import ban (Table 7.4). Germany and the Netherlands account for almost 32% of total EU28 losses. Italy, Latvia, Lithuania and Poland are members of the second group as per the cluster analysis (Figure 7.2). Based on these facts, these countries can be considered the main bearers of the Russian import ban impact. Taken together, these six countries received 63.33% of total EU28 losses due to the ban. In comparison to previous studies (e.g., Djuric et al. 2015; Boulanger et al., 2016), which mainly highlighted Germany, Lithuania, Latvia, and Poland as the main receivers of the import ban impact, it is possible to conclude that the group of highly impacted countries can be enlarged by Italy and the Netherlands, while the 22 other EU countries experienced a significantly smaller impact.

Based on the existing literature on the Russian import ban, it is possible to connect the changes in Russia/EU agri-food trade and production shift in Russia. Part of the agricultural production growth in Russia in the mid-2010s can be attributed to import ban impact (Wengle, 2016); however, production increase coincided with depreciation of ruble which made EU agri-food imports less competitive on the Russian market, providing domestic producers with a less competitive environment and opportunity to compensate for decreasing supply. Increase in

domestic production should also be considered together with the introduction of Russian Food Security Doctrine in 2010 and its reinforcement with the 2020 version (President of the Russian Federation, 2010; President of the Russian Federation, 2020). The Doctrine establishes minimum domestic production shares (or in other words, levels of self-sufficiency) for a specified list of the products, such as grain (95%), sugar (80%), meat and meat products (85%) and milk and dairy products (90%). The coverage of the import ban list is very similar to the products covered by the Doctrine. From this perspective, the import ban has served as an incentive to increase levels of self-sufficiency (Wegren et al., 2017; Wegren & Elvestad, 2018), which, from the point of view of Russian authorities, can be one of the most important achievements in terms of food security.

One of the limitations of the current study is the focus on countries of the European Union. While these countries were indeed important agri-food trading partners for Russia before Western restrictive measures were imposed, the introduction of the Russian import ban has evoked the trade diversion effect. Trading partners on both sides of the economic sanctions were forced to find new trading partners relatively quickly. There is evidence that European exporters have managed to find new export destinations relatively quickly (Uzun & Loginova, 2016); however, there is still an open question about the trade effects in the countries outside of sanctions scope. These questions are still being answered by future studies.

Another limitation of the study is the primary focus on macro-level. Western economic sanctions against Russia, as well as the Russian import ban, are restrictive economic policies which prescribe individual economic agents to either adjust the behavior in accordance with the ruling or face punitive measures. The impact of these measures on individual firms can be different. Partially, heterogeneity of import ban impact on a micro-level has been described, for example, by Wengle (2016), who reported multidirectional impacts on agri-food industries, and by Venkuviene and Masteikiene (2015), who reported that dairy and meat sectors of the Central and Eastern European countries have suffered the most from the Western sanctions and import ban. At the same time, the question of the linkage between firm size and import ban impact is still open, as well as the linkages to the rural development on both sides of the sanctions. All in all, the financial impact of the ban on individual industries or firms represents an opportunity for future research.

As a conclusion, it is possible to state that the impact of the Russian import ban was not uniform for the EU28 countries. Two large groups of countries can be defined: countries in Group

1 saw a 23% decrease in their agri-food trade balance with Russia, while Group 2 experienced a decrease of 48%. Allocation of the import ban effect on agri-food trade is not even, and some of the larger players have experienced a lesser impact than the smaller ones. Examples of such a contrast are Germany (together with the Netherlands, the largest agri-food trading partner of Russia) and Lithuania, which experienced significant losses; however, the losses for Lithuania were relatively more severe. At the same time, the largest losses after the import ban are seen among the countries of Group 2 (Germany, the Netherlands, Lithuania, and Poland). The same group of countries received the largest share of total EU28 losses due to the ban, and these countries can therefore be considered as the main bearers of the impact of the ban.

The speed at which the trade balances of the EU28 countries adapted to the Russian import ban suggests that a potential lifting of the ban could entail a quick re-balancing of EU28 trade with Russia. The analysis shows several candidates, countries that could quickly receive the first benefits once the ban is lifted. These countries are Italy, Latvia, Czechia, and Sweden, as these are countries that have expanded their agri-food trade with Russia even after the introduction of the import ban.

From the perspective of potential economic damage to the sanctioned countries, the Russian import ban has brought specific challenges to the EU28 countries, which enacted restrictive measures against Russia in connection with the events of 2014. From this perspective, the introduction of the ban has achieved its declared goal. On the other hand, it is still an open question whether the ban has affected countries whose political position in the EU allows them to influence the policy of the Union towards Russia. From this perspective, the effectiveness of the import ban can be questioned, and the Russian import ban could be another case of economic sanctions which did not completely fulfil their initial purpose.

8 Results, synthesis, and discussion

8.1 Russian import ban and its main impacts on domestic producers and consumers

Protectionist policy measures, an import ban be an example, have received significant attention by researchers and practitioners. It is also of a great interest to the general public in different countries and is sometimes used by political actors to support their argument about other political topics.

Impact of Russian import ban on agricultural sector of Russia is one of the central for the topic of Russian import ban. In theory, import restrictions are more likely to be imposed than export restrictions. Kaempfer and Lowenberg (1988) states, that sanctions are more likely to restrict imports from the target country that exports to the target, due to the fact that domestic producers are more politically effective interest group than consumers. Imposition of import ban decreases level of domestic competition and provides producers with an opportunity to regain domestic market share. In most of the cases, these factors are favourable for domestic producers. Export restrictions represents the opposite situation: in the absence of export opportunities domestic producers are forced to compete on the (smaller) domestic market only, which put a downward pressure on prices. This explanation is called “a public choice approach”, and Russian import ban seems to be a classic example in this framework.

The magnitude of the pressure on prices differs and depends on variety of factors, such as demand for imports on domestic market (therefore, consumer preferences), elasticity of supply, production volume affected by restrictions, level of import substitution by domestic production and possibilities to source the missing imports at alternative destinations (Caruso, 2003; Marinov, 2005; Eyler, 2007).

One of the first questions, which one may ask in relation to Russian import ban, is the question of what the goal of the import ban was. Hedberg (2018), discusses alternatives and points out, that, although “most certainly, Russia’s policy can aptly be described as protectionism in the guise of countersanctions”, Russia did not ban all the product groups it might have banned if the goal was to merely protect domestic market and provide benefit to domestic producers. In this case, domestic effects of import ban might be considered as a side effect.

What is the direction and magnitude of this effect? As was shown in Chapter 4, for many banned products, Russia was in the position of net importer before 2014 (Table 4.1). Introduction of the ban naturally decreased supply of these products on the domestic market, which entailed increase in domestic consumer prices. Not all prices reacted with the same pattern, and prices of some product groups reacted with a delay. For example, prices of fish and fish products showed highest price rally in the period of 4 to 8 months after the introduction of the ban (Figure 4.1). After this period of price rally, slope of price trend for fish and fish products continued to be the highest among affected product groups. On the other hand, milk prices were rising before the ban and continued to rise after, with lower dynamics than fish products, but higher than meat.

As was also shown in Chapter 4, price dynamics of meat products were mainly driven by increase in beef price (Figure 4.2), partially because import substitution of beef was not as successful, as for pork and poultry; partially this can be explained by natural cycles of beef production. Domestic producers were not able to make up for the dropped part of supply. Partially, the effect of dropped supply was offset by re-exports from countries of EAEU and imports of products originated in these countries. One of the examples is Belarus, which not only attempted to export its own products on Russian market, but also attempted to re-export banned products. This is especially evident in case of milk and dairy products. As was shown previously in Chapter 4, increase in Belarussian export of cheese and milk to Russia do not match the increase in output, but match the increase in Belarussian import of these products (Table 4.2 and Figure 4.4). Based on this evidence, not only Russian producers were in the position to gain benefit, but producers in countries within the same trading bloc (EAEU). This fact states two questions: what part of this effect is attributable for Russian producers and what part is attributable to producers from EAEU?

The first question can be answered by looking into the developments on the milk market of Russian before and after the introduction of import ban. Since Russian economy has significant geographical dimension, it is important to involve the regional aspect into the discussion. As was shown in Chapter 5, based on the results of t-test, it is possible to state that Russian regions are not similar in terms of milk production volumes but are similar in terms of milk prices (Table 5.1 and Table 5.2). At the same time, ANOVA results show, that production of milk does not differ among years, but differ among regions (federal districts), while milk prices are similar among years and regions (Table 5.3 and Table 5.4).

One of the ways to assess the benefit gained by domestic producers is by employing the OECD PSE/CSE methodology. Originally, this methodology is intended to assess the support received by domestic producers and consumers due to the policies implemented domestically. In terms of import ban studies, market price support (MPS) seems to be the most interesting indicator. This indicator shows the value of monetary transfers received by producers or consumers due to the difference between farm gate price on domestic market and reference price, which the is the border price of the commodity adjusted to farm gate level. MPS is part of consumer support estimate (CSE) indicator, which, in case of milk, also include excess feed cost.

Indicators of CSE for products included in the ban list show, that transfers from consumers to producers have increased after the introduction of impact ban. More specifically, out of five product groups (pork, poultry, beef, milk and potatoes), milk, pork and potatoes have experienced increase in transfers to producers from consumers already in 2014 (as was shown on Figure 5.2). Unlike other product groups, milk continued these dynamics and showed highest total values of transfers to producers in years 2015-2018. Increases in total values of transfers are driven mainly by increases in producer prices of milk (as shown on Table 5.7), because changes in production volumes did not make up for the missing supply (Figure 5.6).

However, one of the deficiencies of the PSE/CSE methodology is the fact that it considers the country as a whole and relevant indicators are calculated on the country level only. As was shown in the Chapter 3 and Chapter 5, this limitation can be overridden by recalculating CSE to regional level (federal district, in case of current study). This helps to understand the heterogeneity of the import ban impact – and determine in which regions the consumers experienced most of the ban impact. Federal districts of Russia do not differ significantly in CSE after the import ban, with exception of Far Eastern Federal District. This region has shown differences in milk production volumes, level and direction of prices and monetary support to producers. As a result, this region seems to be the most disconnected from the rest of the Russian market, and this might have an effect in the future development of the region.

Analysis of CSE and structure of agricultural support in Russia also show, that import ban has led to increased support to agricultural producers. An important feature of this, especially in comparison to European Union, is the structure of this support. In Russia, agricultural producers receive more support through price channel, due to higher domestic prices in comparison to

reference price of import. Subsidies do not play an important role, as they do for European producers. Interestingly, incomes of farmers continue to increase even after the introduction of import ban. In the years 2010-2013, incomes of farmers-payers of single agricultural tax (a special system of taxation, mainly for small and medium farmers in Russia) has increased on average by 26%, while in the period of 2014-2017 their incomes had an average of 23% yearly growth rate (Krivko, 2019). At the same time, agricultural tax revenue for the state budget has outperformed all other tax revenue by 19.7% (Krivko, 2019). There might be two main reasons of increase in tax revenue from agricultural sector: better tax collection or increase in profits of agricultural enterprises.

Higher producer prices, in most of the cases, entail higher consumer prices, and it is indeed the case in Russia after import ban introduction (as was shown, for example, on Figure 4.1). Consumer prices of milk and dairy products have been rising before the import ban, and continued to rise after, albeit at an only slightly faster pace. Interestingly, this fact does not meet strong resistance among Russian consumers - they do not protest, rather on the contrary, many of them wish to show "food patriotism" (for a discussion of sociological dimension of the topic see Tovares, 2020). As was shown in Yormirzoev et al. (2018), based on in-person interviews in one of the largest industrial cities of Russia, Russian consumers consider domestically produced cheese to be of lower quality than imported one – however, average willingness to pay discount for domestically produced cheese is only 8 percent. Some consumers have opinion that they support domestic farmers and producers by buying domestically produced cheese, and this is the right thing to do. At the same time, with increasing education and income levels, participants of the survey were less likely to prefer domestically produced cheese for economic or quality reasons.

The presence of food patriotism coupled with increased support to agricultural producers through the price channel establishes a situation, in which there is little incentive for a decision maker to cancel import ban anytime soon. Two dimensions of the issue, political and economic, intersect here. Presence of "food patriotism" among consumers and effectiveness of domestic producers in political pressure (Kaempfer & Lowenberg, 1988) represents the political dimension of an argument against lifting the ban. Economic dimension is described by the fact, that increased support for producers through the price channel allows the government not to worry (to some extent) about additional support measures, such as subsidies. Additionally, this situation leaves

more unused funds in the state budget at the disposal of the government. In other words, import ban favors one group of stakeholders (domestic producers) while there is no mitigating action from the opposite group of stakeholders (domestic consumers). Under these circumstances, it is possible to imagine the lifting of the ban only if favorability to one group (producers) decreases below acceptable threshold, or unfavourability to another group (consumers) reaches unacceptable level. At the same time, evidence from CSE and presence of food patriotism make this situation unlikely to happen anytime soon.

The presence of Russian import ban for several years might be linked to the topic of market power. Naturally, import restrictions favors domestic producers (Kaempfer and Lowenberg, 1988) and therefore are observed more often in the economies around the world. At the same time, such decision has a political cost, among costs in monetary terms. One of the reasonable considerations is that domestic consumers would exercise political pressure on the policy makers to force such restrictions to be cancelled. Channels of such pressure might depend on political structure and features of the country in question. However, the example of Russian import ban shows, that in the case of Russia, the pressure from the domestic consumers does not offset protectionist interests, and as a result import ban remains in force for several consecutive years. But do consumers wish to have the ban lifted? Presence of "food patriotism" argues against this hypothesis. At the same time, there might be a disconnect between consumers interest and interest of policy makers, and therefore not every aspect of consumers' interests is reflected in policy makers' decisions. The threshold of tolerance of Russian consumers is still to be assessed and discussed, which might give more insight into the consumer behavior in other countries with similar features of political system.

8.2 Import ban impact on trading partners

In order to answer the question of what part of the ban effect is attributable to EAEU producers, it is possible to investigate two phenomena: changes in trade competitiveness of EAEU and EU producers and substitution of EU producers by EAEU producers on Russian market. Trade competitiveness indices (such as Lafay or Balassa indices) show the prevalence of export over import of the product group, therefore such indices can be used to assess whether exports of specific product from specific exporter grew relatively to import. Import ban provides a unique opportunity for exporters within EAEU trading bloc to increase trade flows and increase trade competitiveness, while these indicators for EU countries (which are within the scope of the ban) should decrease.

As it was shown in Chapter 6, effect differs by product group. In milk products, trade competitiveness of EAEU countries (measured in terms of Lafay index) was increasing since 2010, however growth was practically stopped in 2014-2017 (Figure 6.1). For two other product groups in scope of the ban (meat and fish), EAEU countries did not show steady growth in trade competitiveness towards Russia. Comparison of developments in EU and EAEU trade competitiveness for products within and out of scope of the ban show, that trade competitiveness and trade specialization of EAEU was the highest in 2014, the year when the import ban was introduced. As can be seen from Table 8.1, difference in pace of trade specialization growth was favourable for EAEU countries in 2013-2017, but decreased in next years, and even reached negative values in 2018.

Table 8.1 Difference in trade specialization growth coefficients, HS01-HS24 product groups for EU and EAEU countries (2010-2019).

	Year									
Coef.	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
EU	0.905***	1.053***	1.115***	0.846***	0.800***	0.981***	0.967***	0.911***	1.024***	1.016***
EAEU	0.823***	1.275***	1.026***	0.944***	1.045***	0.990***	0.999***	0.952***	0.874***	1.104***
Diff.	-0.082	0.222	-0.089	0.098	0.245	0.009	0.032	0.041	-0.15	0.088

*Source: UN COMTRADE, 2021, author's calculations. Note: *p<0.1; **p<0.05; ***p<0.01.*

Based on changes in trade competitiveness indices, it is possible to conclude that EAEU countries did manage to extract some trade benefit from the import ban, however the effect of the ban was rather one-off than constant.

Russia is the biggest player among EAEU members. Gravity theory of trade tells that countries tend to trade more with bigger players near them; additionally, gravity theory also declares that value of trade flows is the function of distance (Coe et al., 2007; Disdier and Head, 2008; Yotov, 2012). Within the framework of this theory, introduction of the ban has increased the distance between Russia and EU countries to infinity (of course, only for the products within the scope of the ban). Therefore, it is reasonable to state, that EAEU members would tend to trade with Russia more, especially after the introduction of import ban. Membership in EAEU should provide these countries a benefit, which is possible to quantify. As was shown in Chapter 6, estimation of gravity model for trade flows of EAEU countries for banned and non-banned products revealed several specifics of this trading bloc (Table 6.3 and Table 6.4).

For the products in scope of the ban, ban coefficient is expectedly negative, which means that ban negatively affected trade flows in these products. Interestingly, ban also negatively affected the trade flows in non-banned product categories, such as HS06 Live trees and HS22 Beverages.

Variable for the EAEU participation is negative for all product groups too, except for HS03 Fish and crustaceans. The only plausible explanation for positive coefficient for product group HS03 is the effect of re-export, similar to the effect described for the case of milk and dairy products through Belarus. The presence of re-export is in line with known fact, that trade restrictions, such as import ban, can be circumvented (Adler-Karlsson, 1982). Negative EAEU participation coefficient provides an evidence that EAEU countries were not successful in compensating the missing imports from EU countries. Since EAEU is effectively a free trade area, one would expect high increases of exports from EAEU countries (Seyoum and Ramirez, 2012; Hart et.al., 2015), however this did not happen. Interestingly, EAEU membership coefficient is also negative for almost all product groups not impacted by the ban (Table 6.4), so, counterintuitively, participation in EAEU is associated with decrease in trade flows. This is also an evidence of the fact, that substitution of missing imports for banned products were done from outside of the EAEU partner countries.

Weak substitution of banned products from within EAEU trading bloc bring about few important considerations. Firstly, if import ban did not provoke import substitution from closest trading partners, then such trading bloc might be revisited or changed soon, because it might not

give all the possible benefits to the members. Secondly, EAEU countries might not be specialised in product categories in scope of the ban, and therefore the imports were substituted by other trading partners.

Investigation of trade effects evoked by Russian import ban also opens the discussion of whether the ban has reached its goal, although the real goal might be different to the proclaimed one. As was shown by Hedberg (2018), if Russia's goal was to solely pursue a protectionist policy and support domestic agricultural producers, it might have an option to include additional product groups into the ban list, however this was not done. This finding reinforces the idea that "far more complex, at times conflicting, considerations underpinned the crafting of Moscow's countersanctions package" (Hedberg, 2018). In other words, Russia attempted to damage several groups of actors more than others. On the one hand, product groups which had higher import tariffs before the ban had higher probability to be included in the import ban list. On the other hand, product groups imported from so-called Big4 group of countries (Germany, France, Italy, and United Kingdom) had significantly lower probability.

This uneven distribution of import ban applicability (from the trade point of view) makes one think about uneven distribution of ban trade impact. As was shown in Chapter 7, the assessment of import ban impact uniformity can be done using scenario estimations and cluster analysis. The analysis shows that the impact of the ban is not distributed uniformly. On the contrary to Hedberg (2018), there is an evidence that two of the Big4 countries, Germany and Italy, have experienced significant trade losses as a result of the ban. Even if economic damage to these countries was not among the initial goals of the ban, ban had hit them. Interestingly, that together with the Netherlands, Germany had increased its share of agri-food trade with Russia, and therefore might be among the first countries to extract benefits once the ban is lifted.

Smaller economies of EU28 did suffer trade losses too. Considering the ratio of ban induced losses to the economy size, Latvia, Lithuania, Italy, and Poland can be named the real bearers of the ban impact. At the same time, considering the proclaimed goal of the ban (to retaliate Western sanctions against Russia), these countries do not seem to be the right target, as their influence on the imposition of the EU sanctions was certainly limited, and it is difficult to imagine their influence on the United States.

9 Conclusion

Even though Russian import ban is one of the examples of economic sanctions, which have received significant coverage in the economic literature, the ban is still connected with several unanswered questions. Current study attempted to contribute to the ongoing academic discussion on the topic of Russian import ban and economic sanctions in general. As a result of the study, some known findings have been confirmed, while some new ones have been reached as well. To some extent, these new findings are applicable not only to the case of Russian import ban, but to the economic sanctions in general.

Current study attempts to answer the question of who can be considered as winners and losers of the Russian import ban. This question, as well as the topic of Russian import ban, has two main dimensions: economic and political. Political dimension of the import ban topic spans across political reasoning to impose the ban, including domestic political implications of such decision. At the same time, economic dimension of the problem contains topics pertaining to several areas of economics, such as international trade (macroeconomic effects of ban, trade diversion effects, circumvention of the ban by trading partners, effects of trading bloc participation), economics of agricultural sector (producers' and consumers' support) and food security (consumer prices effects and food patriotism). Current study touches upon the economic dimension of import ban, and therefore touches the areas of economics mentioned above.

As was shown in the literature review section, the topic of Russian import ban has received significant coverage in economic literature. The issues covered in the relevant pieces of research evolved during the import ban presence. At the very beginning, most of the relevant works were devoted to estimating the value of missing exports from banned countries and GDP impact. An important group of works also provided some important initial considerations relevant to economic sanctions and ban, such as possible ways of circumventing the ban by trading partners. Later, more works were focused on the reasoning behind the introduction of the ban, its scope and duration.

As a result of the literature review, the knowledge gap to be addressed by current study has been identified. Existing works on the topic does not fully cover the problematic of import ban impact distribution, both internal and external, as well as interconnections of import ban effects to regional trading blocs, such as EAEU. Based on the identified knowledge gap, current study states

four partial research questions, which can help to improve understanding of who can be considered as winners and losers of Russian import ban.

Current study can be interesting for academic economists specialised in economic sanctions studies, as well as for agricultural economists. The study can be used by these specialists as a foundation for further sanction studies, including studies of international economic sanctions episodes. It can also be interesting and beneficial for policy makers, especially in the field of agriculture and agribusiness. The evidences of Russian import ban impact presented in the study can help to formulate policy measures for domestic market, as well as trade policy measures. Partially, the evidences presented in the study can be used by economists working in the field of international trade research, especially by those focusing on post-Soviet space, since some of the findings provide an insight into the present state and prospects of the EAEU trade bloc.

Several groups of stakeholders might benefit from the findings of the current study. One group of the stakeholders is researchers in the field of agricultural economics. They can benefit from the findings on regional effects of Russian import ban, including the proposed methodology of regional effect split. Differences between regions of Russia in terms of import ban effect might inspire further research focused on how economic sanctions work in the spatially distributed economies. Emerging food patriotism is especially interesting topic to investigate further, and researchers can use findings of current study (usage of import ban to substitute support from state budget with support by consumers via higher prices) to determine the boundaries of food patriotism. In general, researchers can use the findings of current study as a foundation for own economic research.

Another important group of stakeholders are researchers in the field of international trade, and economic sanctions in particular. Several findings of current study confirm existing knowledge, while some others provide new insights. The findings describe the magnitude of mitigating effect for the participation in EAEU trading bloc, and this finding in turn might raise a question about the level of benefit which participating countries extract from the EAEU. Another important finding, which might be useful for international trade researchers is the (non)uniformity of import ban trade effect, which was shown in the current study.

Very important group of stakeholders, which can use the findings of current study is the policymakers. Current study adds to the existing knowledge on the effects of economic sanctions,

and therefore might help to assess the effectiveness and efficiency of it. Economic sanctions have become more widespread in recent decades than previously, and therefore every decision maker should take into account different effects of such policies before implementing them. Current study attempts to show the broader picture of the Russian import ban and studying different points of view on the topic might help to do more informed decisions in the future. Findings of current study might be used by policymakers as a piece of supporting documentation for proposed policy decisions which involve ban or restriction of imported agri-food products or agricultural commodities.

Main findings of the study can be summarized as answers to the research questions. First research question of the study is what are the main impacts of Russian import ban on agricultural sector and international trade of Russian Federation? Based on the findings described in the study (more specifically in Chapter 4 and Chapter 5), several impacts of the ban can be noted. Among them is the acceleration of price increases for product groups in the ban list (especially in milk, meat, and fish), at the same time the impact of domestic currency depreciation should be accounted for. There is an evidence of re-export of banned products from EAEU countries because these countries are in the trade bloc with Russia but did not introduced the ban measures. One of the examples is re-export of milk and dairy products via Belarus. Re-export of banned products softens the effect of the ban for the domestic consumers. Another important feature evoked by the ban is the emergence of "food patriotism" among Russian consumers. Based on the existing knowledge of this phenomena and findings of current study, it is possible to conclude that there is a significant degree of willingness among Russian consumers to pay the cost of the ban.

Second research question is what is the extent of Russian import ban cost or benefit for the domestic producers and consumers, if any? Despite the presence of re-export, import ban has entailed the short-term shrinkage of supply on Russian market. As was shown in Chapter 5 on the example of milk, Russian producers received additional monetary transfers due to the difference between market price and border price of the banned products. Market price support effectively subsidized domestic producers, and there was little need for special support measures from the budget. As in many other cases of trade sanctions, consumers paid the price of the ban. At the same time, there is a mixed evidence of whether increased transfers to producers from consumers have

entailed increases in production volumes. To the best of the authors knowledge, the findings related to market price support represents new knowledge about the ban impact.

Third research question asks what parties (on domestic and international level) can be considered as main beneficiaries and payers of Russian import ban? Answer to this question is similar to the previous one. Russian consumers paid the cost of the ban, while producers received additional benefit in monetary transfers, which would not otherwise happen if import ban would not be introduced. At the same time, as was shown in Chapter 5, there is a regional aspect in the import ban impact. Some regions (federal districts, for example Far Eastern) show completely different pattern of price movements. The disintegration of regional milk market can be a subject of further inquiry. As was shown in the same chapter, the effect of the ban seems to be fading with the time and seems to be more mid-term than long-term.

Last research question attempts to ask whether the trade effect of Russian import ban is uniformly distributed among main affected parties (namely, European Union)? Based on the scenario estimations and trade data, it is possible to confirm that the impact is not uniformly distributed with regards to trading partners. Among biggest bearers of the ban cost is Lithuania, which was already mentioned in other pieces of research. At the same time, the study points out that Germany, the Netherlands, Poland, and Italy suffered significant losses too, which was previously not mentioned in the economic literature on the topic. Based on this evidence, it is possible to argue that ban had also touched the countries, which were initially not supposed to be impacted, such as Big4 economies of EU (Germany, France, Italy and United Kingdom).

One of the strengths of the current study is the fact that it attempts to provide insight on a lower level than other existing pieces of research. In contrast to other studies on the topic of Russian import ban, current study provides the answers to the question of distribution and uniformity of the import ban impact on domestic regional level, as well as on the level of individual trading partners of Russia (EU member states). Review of the existing literature on the topic shows, that some pieces are still missing in the puzzle, such as effect of trading bloc participation, relief effect of re-export via neighbouring countries, domestic regional dimension of import ban impact; changes in agricultural support (and related incentives for the government to retain the ban) and non-uniformity of the import ban impact on counterparties in EU. All these missing parts of the

puzzle represent two main groups of effects: internal and external. Current study fills in these gaps in knowledge.

As almost any other piece of research, current study has specific limitations. Main limitation of the study is the fact that it investigates the case of Russian import ban only and does only limited comparison of the ban impact to other similar cases of sanctions. This was done intentionally in order to provide the most possible unbiased picture. This limitation can be overcome in further research by comparing the presented evidence of Russian import ban impact with other similar cases of economic sanctions. Another limitation is the fact that the study works with macroeconomic data, while microeconomic data, such as firm-level data, can give more insight of the ban impact. An important limitation of the study if the focus on the effects of the ban EU. While EU was one of the main receivers of the ban effects, possible enlargement of the study by data for other countries, such as the US, Canada, Australia, Iceland and Norway can improve the understanding of ban impacts.

Opportunities for further research on the topic of Russian import ban stem from the limitations of the study. Further research can be focused on the more granular data, including firm-level data, to investigate the level of firm compliance with the ban and the way how the ban changed the domestic market. Another important opportunity lies in the field of consumers' willingness to pay. As the question of food patriotism is covered only partially in the study, it is important to investigate the extent to which domestic consumers are willing to pay for the effects of the ban.

All in all, current study covered the topic of Russian import ban in attempt to fill in the gaps and, together with other research pieces on the same topic, to provide the comprehensive overview. As these words are being written, the ban is still in force, and therefore the final evaluation of the ban is still to be done in the further pieces of research.

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Appendix 1

Descriptive statistics of the dataset. Lafay indexes for Russia-EAEU trade.

Variable	N of observations	Min	Average	Max	Standard deviation
HS01	20	(0.336)	(0.053)	0.269	0.130
HS02	20	1.945	6.206	9.927	2.035
HS03	20	(3.909)	(1.170)	0.287	1.244
HS04	20	4.055	13.499	17.728	4.174
HS05	20	(0.294)	(0.040)	0.013	0.066
HS06	20	(0.006)	0.182	1.131	0.356
HS07	20	0.263	1.237	3.289	1.017
HS08	20	(0.002)	0.605	2.107	0.563
HS09	20	(1.375)	(0.897)	(0.035)	0.291
HS10	20	(3.673)	(1.441)	0.218	0.984
HS11	20	(1.081)	(0.406)	0.096	0.341
HS12	20	(2.264)	(0.680)	(0.243)	0.559
HS13	20	(0.123)	(0.060)	0.079	0.050
HS14	20	(0.005)	(0.002)	0.002	0.002
HS15	20	(5.615)	(3.692)	(1.963)	0.940
HS16	20	(0.523)	1.267	3.422	0.788
HS17	20	(2.086)	1.723	8.504	2.820
HS18	20	(4.734)	(2.652)	(0.726)	1.069
HS19	20	(4.908)	(3.788)	(0.639)	0.877
HS20	20	(2.341)	(1.356)	0.236	0.751
HS21	20	(4.715)	(3.364)	(0.343)	1.570
HS22	20	(4.164)	(1.443)	0.660	1.655
HS23	20	(2.469)	(1.094)	(0.512)	0.600
HS24	20	(4.206)	(2.581)	(0.921)	0.791

Source: EU COMTRADE (2021), author's calculations.

Descriptive statistics of the dataset. Lafay indexes for Russia-EU trade.

Variable	N of observations	Min	Average	Max	Standard deviation
HS01	20	(0.001)	0.296	0.583	0.202
HS02	20	1.012	4.541	7.560	2.021
HS03	20	(15.273)	(6.710)	(2.823)	4.159
HS04	20	4.984	7.334	10.874	1.388
HS05	20	(0.248)	(0.074)	0.006	0.061
HS06	20	0.125	0.958	2.475	0.694
HS07	20	(0.083)	0.562	1.601	0.485
HS08	20	0.259	1.134	2.821	0.814
HS09	20	(0.403)	(0.116)	0.260	0.204
HS10	20	(11.518)	(3.317)	0.041	2.435
HS11	20	(0.379)	0.091	1.183	0.460
HS12	20	(3.361)	(0.990)	(0.178)	0.675
HS13	20	0.004	0.142	0.312	0.082
HS14	20	(0.179)	(0.065)	(0.001)	0.060
HS15	20	(5.356)	(2.743)	(0.277)	1.469
HS16	20	(0.007)	0.636	1.460	0.470
HS17	20	(1.204)	1.379	7.041	2.444
HS18	20	(1.280)	(0.257)	0.804	0.660
HS19	20	(2.015)	(1.137)	0.031	0.650
HS20	20	(0.157)	0.416	1.391	0.439
HS21	20	(1.337)	(0.364)	0.678	0.650
HS22	20	(1.254)	0.637	3.499	1.584
HS23	20	(4.268)	(1.524)	0.085	1.286
HS24	20	(1.500)	(0.829)	0.190	0.408

Source: EU COMTRADE (2021), author's calculations.

Descriptive statistics of the dataset. Gross domestic product, millions USD.

Variable	N of observations	Min	Average	Max	Standard deviation
Armenia	20	12,426.50	26,916.48	40,384.12	7,969.98
Austria	20	374,344.95	435,752.72	500,244.43	37,113.71
Belarus	20	80,367.53	144,272.45	181,286.86	36,752.88
Belgium	20	441,402.95	518,028.54	593,815.13	46,747.86
Bulgaria	20	83,287.42	124,458.74	161,079.68	22,852.48
Croatia	20	80,965.17	101,785.43	115,958.39	9,555.20
Cyprus	20	22,821.68	29,290.14	34,869.27	3,343.32
Czechia	20	256,840.38	343,255.79	430,141.09	51,118.53
Denmark	20	261,768.17	289,552.14	332,729.26	20,120.02
Estonia	20	24,879.14	37,259.75	48,699.66	6,497.83
Finland	20	206,504.00	242,632.59	268,403.68	17,986.68
France	20	2,431,784.63	2,761,436.30	3,097,061.75	188,627.42
Germany	20	3,523,422.37	3,919,436.14	4,473,821.95	313,713.32
Greece	20	307,874.24	349,656.80	419,005.00	39,963.41
Hungary	20	199,595.86	253,354.94	318,723.59	29,588.58
Ireland	20	182,714.79	269,159.26	428,825.38	70,621.08
Italy	20	2,437,267.35	2,530,721.75	2,663,531.57	63,306.40
Kazakhstan	20	152,940.60	329,001.21	487,868.69	104,001.40
Kyrgyzstan	20	15,081.73	23,224.04	33,918.73	5,905.95
Latvia	20	30,433.95	47,199.07	58,971.46	8,371.00
Lithuania	20	48,650.10	77,854.06	103,043.41	15,509.99
Luxembourg	20	42,033.27	55,366.21	70,966.64	8,809.68
Malta	20	10,703.42	14,249.93	21,785.08	3,446.44
Netherlands	20	758,777.43	863,482.52	990,422.80	65,995.79
Poland	20	620,747.96	895,410.84	1,256,319.16	198,057.33
Portugal	20	313,030.89	329,248.45	357,355.11	12,147.99
Romania	20	270,940.23	416,556.36	578,934.46	87,895.04
Slovakia	20	86,685.02	134,389.76	178,852.99	29,018.66
Slovenia	20	52,494.62	66,965.22	80,780.09	7,789.45
Spain	20	1,412,828.15	1,696,562.75	1,924,655.35	135,616.66
Sweden	20	365,921.26	454,120.85	547,238.10	56,104.40
United Kingdom	20	2,245,652.42	2,698,531.80	3,121,120.10	251,199.56
Russia	20	2,142,459.55	3,289,049.14	3,968,180.47	599,354.03

Source: EU COMTRADE (2021), author's calculations.

Descriptive statistics of the dataset. Export to Russia, thousands USD.

Variable	N of observations	Min	Average	Max	Standard deviation
Armenia	480	-	7,906.48	128,211.54	16,706.99
Austria	480	-	18,584.09	222,500.82	32,369.61
Belarus	480	-	2,759.11	88,891.80	8,747.45
Belgium	480	-	625.18	21,936.11	2,468.57
Bulgaria	480	-	695.32	91,107.05	5,958.60
Croatia	480	-	4,031.38	37,287.63	7,165.26
Cyprus	480	-	17,994.43	461,522.75	46,443.54
Czechia	480	-	12,533.33	181,845.32	30,799.99
Denmark	480	-	12,610.62	296,141.01	34,660.33
Estonia	480	-	27,739.91	299,473.08	47,493.81
Finland	480	-	64,469.75	741,577.06	98,108.89
France	480	-	4,470.25	154,821.44	14,845.25
Germany	480	-	11,870.83	258,892.57	26,700.69
Greece	480	-	4,636.99	96,256.95	13,812.34
Hungary	480	-	22,309.62	255,322.54	36,850.51
Ireland	480	-	11,728.99	467,060.81	50,269.75
Italy	480	-	27,493.19	383,127.25	59,621.88
Kazakhstan	480	-	131.35	7,830.24	683.64
Kyrgyzstan	480	-	2.06	893.77	40.84
Latvia	480	-	52,917.82	490,555.86	77,313.32
Lithuania	480	-	31,062.12	397,833.96	48,441.50
Luxembourg	480	-	1,296.63	32,461.76	3,752.29
Malta	480	-	1,439.84	69,824.66	6,128.72
Netherlands	480	-	807.93	13,455.07	1,778.90
Poland	480	-	1,039.14	25,311.14	3,116.94
Portugal	480	-	20,312.71	343,479.40	41,286.37
Romania	480	-	3,552.09	68,228.94	7,717.79
Slovakia	480	-	9,212.04	121,037.32	17,347.94
Slovenia	480	-	7,906.48	128,211.54	16,706.99
Spain	480	-	18,584.09	222,500.82	32,369.61
Sweden	480	-	2,759.11	88,891.80	8,747.45
United Kingdom	480	-	625.18	21,936.11	2,468.57

Source: EU COMTRADE (2021), author's calculations.

Appendix 2