

Vitunskiene, Vlada; Serva, Evaldas

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Lithuanian Agri-Food Industry Responses to Russian Import Ban on Agricultural Products

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**Lithuanian Agri-Food Industry Responses to Russian
Import Ban on Agricultural Products**

Vlada Vitunskiene, Evaldas Serva

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Vlada Vitunskiene, Evaldas Serva

vlada.vitunskiene@asu.lt, evaldas.serva@asu.lt
Aleksandras Stulginskis University

Lithuanian Agri-Food Industry Responses to Russian Import Ban on Agricultural Products

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Abstract

Research background: For a long time before the Russian import ban, Russia was the second most important destination for Lithuania's agricultural exports (after the EU common market), especially for processed dairy and meat products, and edible vegetables. Russia imposed a ban on most agricultural products from the EU in August 2014. Moreover, a year earlier, Russia closed its market for Lithuanian dairy products citing safety concerns. Among the EU countries, the economic impact of the Russian import ban of agricultural products may be most acute in Lithuania.

Purpose of the article is to examine the Russian import ban consequences for Lithuanian agricultural products export and the agri-food industry responses to the Russian import restrictions.

Methodology/methods: The examination has been based on trade and production performance indicators. Time series and spatial analysis of agricultural export flows by HS and the food production.

Findings & Value added: Due to the Russian embargo Lithuania's agricultural production export worth sharply declined in 2014-2015. In volume terms, Lithuania's export of cheese, cream, yogurt and other fermented milk products was significantly lower in 2016 than in 2013, although, butter export has increased, whereas a higher share of raw milk was processed into butter. The production profile of the dairy processing industry has been changing since 2014. Processors have increased output of products like butter and skimmed milk powder which can be sold or stored within the EU intervention programs or exported to alternative markets within the EU or beyond. In 2015-2016, the export of banned agricultural products has been

reoriented towards new markets. The profitability of dairy processors decreased in 2014. However, in 2015, main dairy processors increased the profitability again due to the greatly reduced farm-gate milk prices. Despite the drop of farm-gate milk prices, majority of farmers are continuing milk production. Some of the farms completely switched to local food markets.

Introduction

Lithuanian agri-food industry is export-oriented. In recent years, 44% of processed food have been exported. Total agricultural export worth accounted for approximately EUR 4392 million and representing for over 19% of total goods export in 2016. For a long time pre-Russian import ban, Russia was the second most important destination for Lithuania's agricultural exports, especially for dairy and meat products and edible vegetables. Russia imposed a ban on of certain agricultural products in August 2014¹. Moreover, a year earlier, in August 2013, Russia closed its market for Lithuanian dairy products citing safety concerns. In both cases, sanctions were of political nature. Pickett & Lux (2015) argues that the Russian import ban is inconsistent with the provisions of four instruments such as the Agreement on Agriculture, the GATT, Russia's Protocol of Accession, and the WTO Dispute Settlement Understanding.

Of all the affected countries by Russian agricultural import ban, the EU was potentially the most affected (Boulanger *et al.*, 2016). Among the EU countries, the economic impact of the Russian import restrictions may be most acute in Lithuania which agricultural exports to Russia averaged for 3.5% of Lithuania's GDP in 2009-2013. In the other hand, Kutlina-Dimitrova (2015) argue that the economic literature shows that sanctions may not be very effective instruments to achieve the desired goals especially in the case of an import ban. The import embargo has a redistributive impact on both sanctioning and target country. It decreases welfare in both countries. The analyses concerning Russian agricultural import ban impact on the export flow or the economy generally in sanctioning countries have been carried out by Kutlina-Dimitrova (2015), Oja (2015), Fedoseeva (2016), in target country by Kiselev *et al.* (2015), in both countries by Smutka *et al.* (2016), Klinova & Sidorova (2016). The aim of the article is

¹ On 7 August 2014, Russia imposed a 1-year import ban on a list of agricultural products from the EU, the USA, Norway, Canada and Australia. This list covers almost all meat products, milk and dairy products, fruits and vegetables, fish and crustaceans. On 25 July 2015, Russia announced a 1 year prolongation of the ban on agricultural products (Boulanger *et al.*, 2016).

to examine the Russian import ban consequences for Lithuanian agricultural products export and the agricultural industry responses to the Russian import restrictions.

Method of the Research

To determine the Russian import ban consequences for Lithuanian agricultural export and the agri-food industry responses to the Russian import restrictions in question in different groups of products, we focus on different trade performance indicators:

To determine the Russian import ban consequences for Lithuanian agricultural products export and the agri-food industry responses to the Russian import restrictions in question in different groups of products, the following trade performance indicators were used:

- Export worth growth
- Share of export to destination country's market in total national exports
- Absolute change of destination market share
- Relative change of market share
- Trade entropy index for export
- Herfindahl Hirschman Index (HHI)
- Equivalent number of export markets
- Sales and gross margin

As is known, the econometric application of entropy indicator that is applied to international trade relations comes from information theory and has also taken its way to various economic concentration problems, such as income distribution or market power analyses (Laaser and Schrader, 2002). The entropy index Hirsch and Lev (1971) used as the export diversification indicator, while Yilmaz (2005) this index used as one of the indicators of the international competitiveness. Based on the export entropy index, La (2011) proposes adjusted export market diversification indices to identify the actual effects of export market diversification on export instability.

The trade entropy index for export can be expressed mathematically as follows (Laaser and Schrader, 2002):

$$I_{xi} = \sum_j b_{ij} \ln(1/b_{ij}) \text{ with } 0 < b_{ij} < 1 \text{ and } \sum_j b_{ij} = 1, \quad (1)$$

where: I_{xi} denotes the trade entropy index for export of country i and $b_{ij} = x_{ij} / X_i$ is the export share of country i to country j . This entropy indicator is used to measure the spatial concentration or dispersion of the export flow

of the reporting country. The higher the I_{xi} , the more spatial dispersed the export flow of that country, i.e. the more diversified the export markets. The maximum value of this entropy index is achieved when all export share is shares are equal to each other and vice versa its minimum value is achieved when all exports are concentrated in a single export destination (Yilmaz, 2005; La, 2011).

The most commonly accepted measure of market concentration is the Hirschman-Herfindahl index (HHI), which sums the squared shares of each commodity market in total exports (Agosin *et al.*, 2012). The following mathematical expression gives this identity:

$$HHI_{xi} = \sum (x_{ij}/X_i)^2, \quad (2)$$

where: HHI_{xi} denotes the export market concentration index, x_{ij} is the export of country i to market of destination country j and X_i denotes total export of country i . The HHI index above 0.25 indicates the high concentrated export market, between 0.15 and 0.25 indicates the moderate concentrated export market and below 0.15 indicates an unconcentrated export market.

The equivalent number of export markets is the inverse of the corresponding Herfindahl-Hirschman Index (HHI). According to the technical notes of Trade Performance Index (TPI) developed by International Trade Centre (ITC, 2007) the equivalent number, is a theoretical dimension which represents the number of export markets of identical size that would lead to the degree of export concentration exactly equal to the observed one. The number of equivalent export markets ($NE = 1/HHI_{xi}$) used for measuring export market diversification distinguishes for each country when the number of partner countries weighed according to their importance. The bigger the NE, the greater the diversification of markets. Diversifying partner countries reduces a country's dependence on a small number of destination countries.

Export flow data comes from the ITC Trade Map dataset by Harmonized System (HS Rev. 2012) 2-digit and 4-digit levels for the time-period 2011-2016. In calculating trade performance indicators, the grouping used is as follows: all agricultural products (HS 01-24); dairy produce and ice cream (HS from 0401 to 0406 and 2105); meat and preparations of meat (02 and from 1601 to 1602) and edible vegetables (HS 07). The data of sales and gross margin of dairy processors extracted from Nasdaq Baltic dataset in 2011-2016.

Results

In 2014-2016, export worth of Lithuania's agricultural products declined an average by 2.8% per year, meanwhile export worth of dairy produce and edible vegetables fell sharply (Table 1) with average by 15% and 17.5% per year respectively.

Table 1. Lithuania's agricultural export trends in pre- and post-Russian import ban

Products' group (CN code)	Export growth (2013=100)	Export change per annum (%)						Relative change of export market share per annum (%)			
		to Russian Federation		to World		to EU		in World		in EU	
		2011-2013	2014-2016	2011-2013	2014-2015	2011-2013	2014-2016	2011-2013	2014-2015	2011-2013	2014-2016
All agricultural products	93.4	18.0	-37.7	19.4	-2.8	12.3	8.1	9.9	-4.1	5.2	2.9
Dairy produce and ice cream	72.2	5.0	-92.1	12.3	-15.0	12.6	-3.4	3.2	-13.9	6.4	-0.9
Meat and preparations of meat	86.6	1.5	-77.3	12.2	-3.6	18.2	7.5	9.5	-8.9	9.6	9.4
Edible vegetables	49.8	25.0	-88.8	27.6	-17.5	20.4	21.2	23.1	-32.4	11.8	10.1

Source: own calculations based on ITC Trade Map data

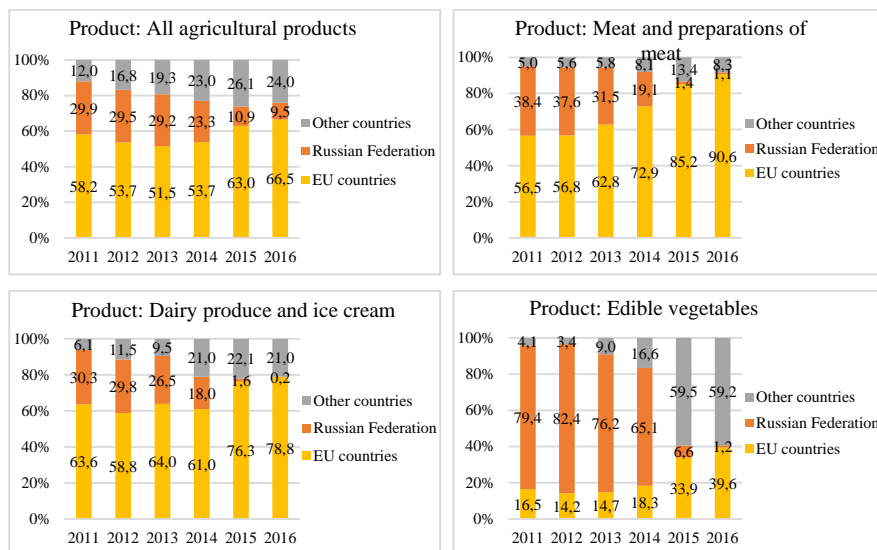
The main Lithuania's agricultural export destination has been the EU for more than two decades. The EU common market received more than two-thirds of total Lithuania's agricultural export in 2016 (Figure 1). Moreover, since Russian import ban in 2014 Lithuania's agricultural export worth to the EU by almost a quarter, while export indicator for vegetables doubled and for dairy products increased by more than a quarter. Most of the industries affected by Russian import ban either found alternative markets within the EU or beyond as indicates graphs in table 3.

For a long time pre-Russian import ban, Russia was the second most important destination for Lithuania's agricultural exports, especially for processed food, and for the three product groups – dairy and meat products and edible vegetables. Regardless of the high level of political and economic risk, the Russian market was very profitable and attractive for Lithuania's food exporters. For instance, in pre-Russian import ban the export to Russia accounted for more than three-quarters of vegetable export (including re-export), one third of meat products export, and around 30% of dairy products export in 2010-2013.

Traditional Lithuanian export markets for the dairy and meat products are characterized by fierce competition and relatively low annual import growth. Meanwhile, the Lithuania's export meagerly oriented towards the fastest growing food import markets.

Foremost, Lithuania's agricultural export markets has been diversified

over 2013-2015 period. According to ITC data, the rank of Lithuania's processed food market diversification has risen from 49 in 2013 to 28 in 2015 **Figure 1**. Most important destinations for Lithuania's agricultural exports in 2011-2016 (share of export in %)



Source: own calculations based on ITC Trade Map data

and the rank of fresh food market diversification has risen from 102 to 21 at the same time. Table 2 summarizes the markets concentration and diversification results and their allocation matrix for the exports of dairy and meat products and edible vegetables. For instance, Lithuanian producers found new export markets, e.g. for dairy produce – in Saudi Arabia, Korea, Morocco, Hong Kong, Armenia, Singapore, for vegetables in India, Egypt, Malaysia, Pakistan, Sudan; for meat and preparations of meat – in Georgia, Hong Kong, China, United States, Croatia.

The results of the analysis of export markets concentration and diversification suggest that:

- The HHI show that the export market concentration of dairy products and edible vegetables was greater in pre-Russian import ban period than post.
- The significant growth of markets diversification observed in edible vegetables export, i.e. in post-Russian import ban the number of equivalent markets raised more than threefold.

- The export entropy index show the decreased export markets diversification of meat and preparations of meat in post-Russian import ban. Vice versa situation can be observed in edible vegetable export.

Table 2. Lithuania's export market concentration and diversification in pre- and post-Russian import ban

Products' group (CN code)	Herfindahl Hirschman Index (HHI)			Market diversification (Number of equivalent markets)			Trade entropy index for export		
	2011- 2013	2014	2015- 2016	2011- 2013	2014	2015- 2016	2011- 2013	2014	2015- 2016
Dairy produce and ice cream	0.15	0.10	0.11	7	10	9	0.48	0.40	0.42
Meat and preparations of meat	0.09	0.15	0.09	11	7	12	0.49	0.42	0.39
Edible vegetables	0.63	0.45	0.13	2	2	7	0.33	0.47	0.46

Source: own calculations based on ITC Trade Map data

As mentioned above, the Russian import ban affected Lithuanian dairy and vegetable industries the most. The edible vegetables export mainly declined due to reduced re-export, while the dairy produce export was the most on products by Lithuanian origin. In 2014-2016, sales of main Lithuania dairy processors declined an average by 25.2% per year (Table 3).

Table 3. Trade performance indicators of major Lithuanian dairy processors in pre- and post-Russian import ban

Company	Sales growth (2013 = 100)	Change in sales per annum (%)						Gross margin (% of sales)					
		in non EU market		in EU market		in Lithuanian market							
		2011- 2013	2013- 2015	2011- 2013	2013- 2015	2011- 2013	2013- 2015	2012	2013	2014	2015	2016	
Rokiskio suris AB	82.2	-36.4	-18.8	16.5	-18.3	1.5	-8.0	14.2	11.2	12.2	7.7	12.5	
Pieno Zvaigzdes AB	68.3	5.9	-58.0	1.7	23.8	3.3	0.4	18.9	19.0	16.5	15.6	20.4	
Vilkyskiu pienine AB	76.4	28.3	-41.0	3.5	12.9	23.6	-11.2	10.1	10.2	11.2	10.3	10.5	
Zemaitijos Pienas AB	9.5	1.2	-16.0	13.5	4.2	0.2	0.7	19.2	19.0	16.4	24.7	24.6	

Source: own calculations based on Nasdaq Baltic data

In 2014, gross margin of companies Pieno zvaigzdes AB and Zemaitijos pienas AB decreased by 2.5% and 2.7% respectively. There was one-time business solution made by Rokiskio suris AB as a quick response to the Russian import embargo. In August 2014, the company Rokiskio suris AB

immediately began to export dairy products to the United States, due to the need to empty the accumulated stocks, even though the financial result was zero. Due to a recent change in the euro-dollar exchange rate, the food export to the United States has become profitable and gross margin of total sales increased.

In 2014-2015, the export of banned agricultural products has been reoriented in to alternative markets within the EU or beyond. In 2015, Pieno zvaigzdes AB and Vilkyskiu pienine AB increased export to the EU market by 23.8% and 19% respectively. Some share of displaced food exports was sold in domestic markets, bringing down the prices which, in turn, benefit consumers.

Due to the Russian import ban, Lithuanian dairy industry situation was critical and a wide spectrum of policy instruments and initiatives to stabilize market had been offered at both EU and Lithuanian government levels. However, increased financial support has negatively determined dairy processors' pricing behavior. Paradoxically, the special financial assistance for milk producers, which are aimed to effectively eliminate market disturbance caused by a significant price fall, encourage the processors to reduce milk farm gate prices. Besides that, dairy processing industry changed production profile. For instance, dairy processors decreased production of cheese, curd, yoghurt, creams, ice cream, however increased production of butter, fresh cheese, drinking milk, and non-fat dried milk products. Processors have increased output of products like butter and skimmed milk powder which can be sold or stored within the EU intervention programs. As the outcome, major dairy processors increased profitability from 2014 to 2016. A drop in farm-gate milk prices reduced profitability in raw milk production. Despite such prices drop, most Lithuanian farmers continued milk production. Some of the farms completely switched to local food markets. Unlike large farmers, small farmers were the most vulnerable segment of the Lithuania's dairy supply chain in the context of the Russian import ban.

Conclusions

The empirical analysis was made on trade performance indicators based on Lithuanian agricultural exports flows and on four major dairy processors data in pre- and post-Russian import ban period. The analysis reveals that the Russian import ban affected Lithuanian dairy and vegetable industries the most. However, estimating the possible extension of empirical research agricultural exports are not likely to be affected by sanctions' extension because the export flow has already been redirected to other markets: ex-

port increased to already established markets as well as new markets. However, profitability of Lithuanian dairy processors will remain relatively lower than in 2014, because exports to Russia have been more profitable than to other markets.

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