Chapter 15
Trade Relations Between the Russian Far East and Northeast Asia: Assessment of Institutional Factors

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Abstract The present study assesses the extent of institutional barriers to trade between the Russian Far East (RFE) and Northeast Asian countries by decomposing the overall costs of cross-border trade. The results indicate that the duties imposed by Russia on RFE exports are the main determinant of tariff hurdles between RFE and Northeast Asia. The institutional barriers between RFE and China are shown to have decreased, while those with Japan have increased. Over the 2002–2017 period, institutional impediments to trade between RFE and China halved, whereas those between RFE and Japan almost doubled. The findings suggest that, in terms of mitigating institutional barriers, there was a divergence between almost all RFE regions and Japan, and convergence with China and South Korea. For most RFE regions, institutional barriers with China have decreased, indicating a general convergence of the RFE economy with China. In general, China has inevitably emerged as an intermediary and an indispensable factor in the trade of RFE regions with Japan. Russian raw materials are processed in China and exported to the Japanese market. Japanese companies produce goods in China and export them to the Russian market. A similar model of economic interactions certainly exists for South Korea, but so far on a much smaller scale.

15.1 Introduction

In recent years, the Russian government has focused on solving the socio-economic problems plaguing the Russian Far East (RFE), where economic development has been lagging behind the national average for a long time. Over a period of about a quarter of a century, the economy of Russia grew by 11%, while in RFE it declined

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by 2.4%. The prospects for development in RFE became apparent when opportunities and conditions for the use of its potential were created. The development of the RFE economy is largely determined by the scale of its foreign trade and economic activity. RFE has opportunities for expanding trade and economic interactions with foreign markets thanks to a special geographical location, its proximity to the dynamic economies of the Asia-Pacific region, its natural resource endowment, and the availability of transport and transit infrastructure.

Due to its large natural resource potential, the products of RFE's raw materials sector have long focused on foreign markets. Expansion of commodity supplies to other regions of Russia has been hampered by the remoteness of RFE and competition from enterprises in Siberia and the Urals that produce similar goods. For these reasons, for the Far Eastern economy, the markets of neighboring countries in Northeast Asia (NEA) have grown in importance. Subsequently, the five enlarged commodity groups of exports (products of the fuel and energy sector; non-ferrous and ferrous ores; wood and wood products; fish products) accounted for more than 90% of the value of RFE exports.

In 2002–2017, the scale of trade with foreign countries on average exceeded the trade turnover with the domestic market by more than 30% in terms of value. Since 2007, the volume of trade between RFE and NEA has steadily exceeded the value of trade between RFE and the domestic market. Thanks to new joint oil and gas projects with foreign capital in the Sakhalin Region, the value share of the fuel and energy sector in the export of RFE has increased. The largest Russian companies began to expand investment in RFE's infrastructure, aimed at increasing the volume of foreign trade with Asia-Pacific countries, and, above all, with NEA countries.

The specialization of RFE exports, and Russian exports as a whole, in a limited range of products with low value-added, resulted in a close link between RFE's economic growth and the dynamics of the global pricing environment for commodities. Due to the downward trend for resource goods on the world market, the value of the turnover of RFE with foreign countries in 2016 decreased to the level of 2008.

External demand from foreign markets for RFE products is mainly determined by the positive economic dynamics of the leading countries in NEA. Despite the fluctuations in world prices, the geographical pattern of trade between RFE and foreign countries for 2002–2017 stabilized. Each of the three NEA countries—China, Japan and South Korea, which are geographically close to RFE, accounted for each on average for approximately 25% of the value of trade turnover. Besides exports, since 2006 RFE imports from NEA have been on the rise, replacing products previously imported from the European Union (EU-28).

For RFE, the intensification and expansion of the scale of trade and economic interactions with foreign countries are necessary components of the accelerated development of the economy [1]. This, in turn, calls for the reduction of various restrictions or barriers that hinder the growth of mutual trade.

15.2 The Relevance of the Research and Literature Review

One way to determine trade barriers is to obtain a quantitative assessment of the border effects [2, 3] estimated from a gravity model [4]. In the gravity framework, it is assumed that the value of trade between the two economies is proportional to the product of the size of their markets, which are expressed in GDP or GRP, i.e., as a kind of gravitational component, similar to the multiplication of the masses.

The border effect is conceptualized as a combination of trade and economic barriers that hinder trade interactions. In other words, these are the economic costs arising from crossing a border by a commodity [5]. Reducing the border effect should be understood as an increase in the intensity of trade interactions between the economies in question.

From an econometric perspective, gravity models have a rather high explanatory power of variables forming trade flows [6] and represent one of the most stable empirical relationships in economic analysis. In general, this approach is used to evaluate: the potential of bilateral trade [7]; changes in the structure of trade interactions [8]; the effectiveness of public policy measures [9]; border effects, including for the purposes of explaining trade flows of regions with domestic and foreign markets [10].

For Russia, these models have been widely applied to obtain estimates of the trade integration with the global economy [11] and with post-Soviet countries [12]. Moreover, a gravity model for the Russian economy was used to estimate the potential of expanding investment inflows and outflows with foreign countries [13].

Despite the simplicity of the methodology for assessing trade barriers in the gravity framework, to date, only a few studies use it for exploring the intensity of trade interactions between Russian regions and various markets. A study of the interaction of Russian regions with foreign markets [14] revealed a significant impact of spatial variables, and especially the geographical location of customs checkpoints along the border, on the value and routes of Russian imports. With regard to RFE, the border effects have been evaluated only in certain aspects, such as for the trade of border regions with China in the 2000s [15] and for intraregional trade relations in the early 2000s [16].

15.3 The Purpose of the Study and Methodology

The present study contributes to and extends the existing literature on assessing the border effects of RFE regions in recent years [17, 18]. The authors of this paper have consistently studied the border effects by comparing intraregional and external trade and economic interactions of RFE regions. In this article, the authors decompose the border effect in order to obtain a quantitative assessment of the impact of institutional factors (barriers) on the trade of RFE regions with foreign markets represented by the three main NEA countries.

This study uses the gravity framework to quantify the border effects between RFE and the NEA countries over the period 2002–2017 and conducts a decomposition, which allows us to identify the institutional barriers to trade. The resulting estimates help us analyze the relative intensity of trade interactions of RFE with foreign markets.

The study is structured as follows: (1) selection of a model specification; (2) selection of a benchmark and assessment of border effects in the form of tariff equivalents for trade between RFE and NEA countries; (3) decomposition of the resulting border effects; (4) comparative analysis of institutional vs. non-institutional barriers; (5) analysis of the process of convergence/divergence of trade interactions between RFE and NEA countries with regard to the dynamics of institutional barriers.

The gravity framework used in this paper was first defined by [2] and specifies bilateral trade flows as follows:

$$x_{ij} = F\left(y_i,\ y_j,\ t_{ij},\ MR_i,\ MR_j,\ \sigma\right), \tag{15.1}$$

where x_{ij} stands for the exports from country i to country j, which is a function of the size of the economies of the trading partners (y_i and y_j), the bilateral trade costs (t_{ij}), and the elasticity of substitution (σ), which is assumed to be 5. The multilateral trade resistance terms (MR_i and MR_j) measure the average barriers to trade that countries i and j experience with all of their other trading partners.

The function in Eq. (15.1) is nonlinear and needs to be linearized before it can be used in an empirical setting. After some adjustments, the resulting empirical model takes the form of:

$$\ln\left(\frac{x_{ijt}}{y_{it}y_{jt}}\right) = \beta_0 + \alpha_i\lambda_i + \alpha_j\lambda_j + \eta_t + \beta_1 \ln \mathrm{DIST}_{ij} + \beta_2 \mathrm{CONT}_{ij} + \beta_3(\mathrm{RFE} \times \mathrm{CHN}) + \beta_4(\mathrm{RFE} \times \mathrm{JPN}) + \varepsilon_{ijt}, \tag{15.2}$$

where the dependent variable is log of bilateral trade adjusted for the size of the two trading economies at time t. The two multilateral trade resistance terms are represented by the exporter and importer fixed effects (λ_i and λ_j, respectively). Year-fixed effects account (η_t) for shocks over time common across all trading partners. Trade costs are broken down into three components, measured as categorical variables. Geographical distance (DIST) is measured as the great-circle distance between capital cities (or major administrative centers in the case of regions). Contiguity (CONT) takes into account shared borders between trading partners. The border effects (RFE x CHN and RFE x JPN) denote all remaining bilateral trade costs between RFE on the one hand, and China and Japan on the other. The border effect between RFE and China takes the value of 1 for exports from China to RFE and for exports from RFE to China, and 0 otherwise. The same procedure is used for the border effect with Japan. The benchmark for assessing the two aforementioned border effects is the trade between RFE and South Korea. To obtain the tariff equivalent of the border effect in percent, we take the exponential of the ratio of the corresponding beta coefficient and $(1-\sigma)$, subtract 1 from it and multiply by 100. Data on trade and

GRP of Russian regions were obtained from the Federal Customs Service of Russia and the Russian Federal State Statistics Service, respectively. Data on the GDP of China, Japan, and Korea were collected from the World Bank's World Development Indicators database.

The next step in the quantitative assessment of institutional barriers is to determine the contribution of bilateral tariff barriers and transportation costs to the border effect. Institutional barriers in ad valorem equivalent represent the difference between the border effect and non-institutional barriers, which in this study are defined as tariff and transportation costs.

Tariff barriers consist of ad valorem duties, as well as ad valorem equivalents of non-ad Valorem duties, as reflected in customs tariffs. In this study, tariff barriers include import and export duties. Accordingly, tariff barriers consist of: duties on the import of goods in RFE from NEA countries and vice versa; export duties on goods shipped from RFE regions to China, Japan and South Korea and vice versa.

Transportation costs in ad valorem equivalent can be estimated either directly by using a large amount of data or by employing available indirect estimates based on empirical evidence. In this study, transportation costs in ad valorem equivalent were estimated using the latter method [19], which assumes that for a given good being transported between destinations every day spent on the road corresponds to between 0.6 and 2.1% of its value (on average 1.35%).

15.4 Results

The goal of the study is to estimate the tariff equivalent of the border effect between RFE and foreign countries. First, in accordance with the logic of the study, it is necessary to define a benchmark for assessing the border effect between the Far East and NEA countries in the framework of the model specified by Eq. (15.2). We use three different benchmarks (China, Japan, and South Korea). The results presented in Table 15.1 indicate that all estimated coefficients are statistically significant and have the expected signs.

Distance and contiguity have a negative and positive effect, respectively. Furthermore, the tariff equivalents shown in the second, fourth, and sixth columns suggest that the choice of benchmark makes no difference. South Korea has the lowest border effects with RFE (marked by the negative signs of the tariff equivalents vis-à-vis China and Japan), while Japan has the highest. Given its low border effects relative to the other two NEA countries, we select Korea as the benchmark for the rest of the analysis.

In Table 15.2, we present the results for the entire sample period as well as for two subperiods of equal length. In the years 2002–2017, RFE's border effect with China amounted to a tariff equivalent of 49% above the one for Korea, while Japan's tariff equivalent was 75% above the benchmark. The results also indicate that the border effect declined over time in the case of China (from 60 to 39%), whereas Japan experienced an increase in trade costs with RFE (from 55 to 99%).

Table 15.1 Border effects of RFE for various benchmarks, 2002–2017

Benchmark	China		Japan		Korea	
RFE × JPN	−0.660** (0.288)	**17.94**			−2.246*** (0.254)	**75.33**
RFE × KOR	1.585*** (0.289)	**−32.72**	2.246*** (0.254)	**−42.97**		
RFE × CHN			0.660** (0.288)	**−15.21**	−1.585*** (0.288)	**48.62**
ln(Distance)	−0.741*** (0.185)		−0.741*** (0.285)		−0.741*** (0.185)	
Contiguity	1.433*** (0.277)		1.434*** (0.277)		1.434*** (0.277)	
Constant	−28.268*** (1.528)		−28.928*** (1.432)		−26.682*** (1.436)	
Obs.	815		815		815	
R^2	0.27		0.27		0.27	

Note Fixed effects estimation with time- and exporter/importer dummies. Robust standard errors are in parentheses. The tariff equivalent of the border effects (in %) is shown in bold assuming an elasticity of substitution $\sigma = 5$. *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$

Table 15.2 Border effects of RFE for various periods (Korea used as a benchmark)

	2002–2017		2002–2009		2010–2017	
RFE × CHN	−1.585*** (0.288)	**48.62**	−1.886*** (0.411)	**60.24**	−1.306*** (0.404)	**38.61**
RFE × JPN	−2.246*** (0.254)	**75.33**	−1.743*** (0.358)	**54.61**	−2.757*** (0.359)	**99.22**
ln(Distance)	−0.741*** (0.185)		−0.514** (0.263)		−0.973*** (0.257)	
Contiguity	1.434*** (0.277)		1.850*** (0.391)		1.025*** (0.390)	
Constant	−26.682*** (1.436)		−28.609*** (2.027)		−24.623*** (1.980)	
Obs.	815		404		411	
R^2	0.27		0.24		0.30	

Note: Fixed effects estimation with time- and exporter/importer dummies. Robust standard errors are in parentheses. The tariff equivalent of the border effects (in %) is shown in bold assuming an elasticity of substitution $\sigma = 5$. *$p < .10$; **$p < .05$; ***$p < .01$

The next step in the analysis involves the decomposition of the border effect into institutional and non-institutional factors. The latter consist of tariff barriers and transportation costs, which need to be measured.

First, we calculate ad valorem equivalents of non-ad Valorem duties, which cover specific and mixed duties for various product groups using six-digit and ten-digit HS

Table 15.3 Tariff barriers between RFE and NEA countries

		China	Korea	Japan
2002–2017	Total	13.89	15.76	16.72
	RFE's import barriers	5.75	5.82	3.47
	RFE's export barriers	8.14	9.94	13.26
	Import duties of NEA countries	2.28	2.53	0.83
	RFE's export duties	5.85	7.42	12.43
2002–2009	Total	13.14	13.44	13.34
	RFE's import barriers	4.76	5.30	4.43
	RFE's export barriers	8.38	8.13	8.91
	Import duties of NEA countries	2.54	2.60	1.03
	RFE's export duties	5.84	5.53	7.88
2010–2017	Total	14.64	18.09	20.11
	RFE's import barriers	6.74	6.34	2.50
	RFE's export barriers	7.90	11.75	17.61
	Import duties of NEA countries	2.03	2.45	0.63
	RFE's export duties	5.87	9.30	16.98

Source Authors' estimation

codes [20]. As a result, tariff barriers were estimated as weighted average customs duties for each HS product group (HS 2002) for RFE's trade with NEA countries for 2002–2017.

For imports, we use duties reported in the Customs Tariff of Russia (until 2010) and the Common Customs Tariff of the Eurasian Economic Union (since 2010). For exports, we apply export duties specified in the decrees of the Russian government, as well as duties on Russian products imported by each of the three NEA countries.

The results in Table 15.3 indicate that despite relatively similar values of tariff barriers between RFE and NEA countries, the largest tariff hurdles were with Japan.

The assessment shows that duties paid in Russia for RFE exports made up the largest share of tariff barriers. In the 2010s, duties on the two main export commodity groups for RFE—crude oil and wood products—increased significantly: 4.3 and 2.5 times, respectively. Subsequently, export duties began to be collected on oil products [21, 22], as well as on other goods with a smaller share in RFE exports (e.g., some grain crops, as well as ferrous and non-ferrous metals). Due to the increase in deliveries from China in 2010–2017, the contribution of import duties to tariff barriers between RFE and China grew in importance. Since RFE exports consist mainly of goods with low value-added, NEA countries impose low duties, whose contribution to tariff barriers is rather insignificant. Accordingly, the main sources of bilateral tariff barriers are export and import duties paid on the Russian side of the border.

As for the contribution of transportation costs, the available information used to obtain an indirect estimate suggests that the delivery of goods from RFE (the port of

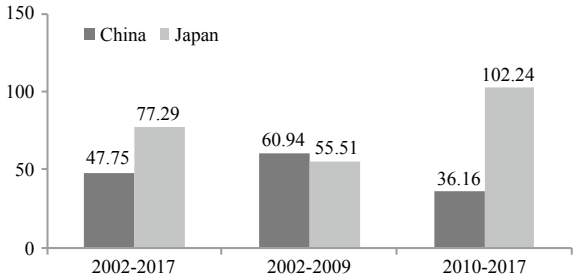

Fig. 15.1 RFE's institutional barriers with China and Japan (relative to the barriers between RFE and Korea), %. *Source* Authors' estimation

Vladivostok) took 2 days to South Korea (the port of Busan) and 3 days to China (the port of Dalian) and Japan (the port of Toyama). In this study, transportation costs in ad valorem equivalent were estimated using the notion [19] that for a given good being transported between destinations every day spent on the road corresponds to between 0.6 and 2.1% of its value, i.e., on average 1.35% per day.

Trade between RFE and South Korea is chosen as the benchmark for obtaining comparative estimates of RFE's border effects with China and Japan. Therefore, non-institutional barriers were adjusted accordingly with barriers to trade between RFE and South Korea as numeraire. Furthermore, relative institutional barriers in ad Valorem equivalent were evaluated as the difference between the total border effect and the non-institutional barriers, i.e., tariff and transportation costs (Fig. 15.1).

Relative to the benchmark, RFE's institutional barriers with China have declined, while those with Japan have increased. In this aspect, we detect a process of convergence between China and Korea and divergence between Japan and the benchmark. Over the 2002–2017 period, RFE's institutional barriers with China almost halved, whereas with Japan they almost doubled. The intensity of trade between RFE and China is gradually increasing relative to the trade between RFE and South Korea.

The estimates for the RFE as a single macro-region are indicative but rather aggregated. RFE includes nine regional economies that vary by size, are separated from each other by long distances and have varying degrees of trade interactions with the nearest foreign markets, including the NEA countries. In addition, some regions do not have seaports, are not connected to the railway network, and lack the infrastructure to facilitate the exchange of goods by road, greatly complicating their trade relations with foreign countries. The product mix in trade with NEA countries also varies across RFE regions leading to different tariff barriers. These factors might contribute to differences across RFE regions in terms of institutional barriers with NEA countries.

The decomposition of the border effects in Table 15.4 shows that most RFE regions exhibited large institutional barriers with China relative to the benchmark.

In 2002–2017, the Amur region and the Jewish autonomous region (JAR) recorded relatively low institutional barriers with China, due to their territorial proximity, which is associated with better cross-border infrastructure. Sakha Yakutia and the Khabarovsk territory exhibited similar tendencies over the 2010–2017 period. For

Table 15.4 Decomposition of border effects between RFE and China by region and period (Korea used as a benchmark)

	Non-institutional barriers			Institutional barriers		
	2002–2017	2002–2009	2010–2017	2002–2017	2002–2009	2010–2017
Amur region	−2.51	−2.13	−2.89	−45.45	−39.44	−50.95
Jewish autonomous region	0.01	−0.83	0.86	−35.80	−55.55	−7.86
Kamchatka territory	−1.81	−0.59	−3.02	80.31	105.57	57.82
Magadan region	3.37	6.58	0.16	158.47	180.39	137.84
Primorie territory	−0.20	−0.67	0.28	35.39	37.07	33.76
Sakha Yakutia	−3.14	−0.11	−6.16	23.73	64.35	−9.94
Sakhalin region	0.40	0.52	0.28	59.24	23.73	105.11
Khabarovsk territory	3.66	3.57	3.74	1.26	3.60	−1.02
Chukotka autonomous region	−0.36	2.64	−3.37	25.15	22.03	30.44

the Khabarovsk territory, non-institutional barriers with China were higher than institutional ones, due to high export duties on wood products and petroleum products. It is likely that the construction of new cross-border infrastructure (bridges across the Amur River that would link China and Russia) will boost trade between the four aforementioned regions and China. With the exception of Sakhalin region (specialized in exporting oil and gas products), Chukotka, and JAR (the smallest RFE economies), the rest of RFE's regions enjoyed a decrease in the institutional barriers with China, signifying convergence between RFE and the Chinese market.

We also carried out decomposition of the border effects between RFE regions and Japan and present the results in Table 15.5. The calculations show that the institutional barriers with Japan were significantly higher than with South Korea and accounted for most of the border effects exhibited by RFE regions. The Kamchatka Territory had the highest institutional barriers, probably due to fish and seafood exports to Japan that are not sufficiently well reflected in the official statistics. Almost all RFE regions saw a rise in institutional hurdles with Japan (with the exception of the Khabarovsk Territory and Chukotka), prompting exporters and importers to seek alternatives in other Pacific Rim countries or on the domestic market. The high non-institutional barriers exhibited by the Khabarovsk Territory can be explained by the high export duties on forest products, which are exported to South Korea in much smaller volumes than to Japan.

Table 15.5 Decomposition of border effects between RFE and Japan by region and period (Korea used as a benchmark)

	Non-institutional barriers			Institutional barriers		
	2002–2017	2002–2009	2010–2017	2002–2017	2002–2009	2010–2017
Amur region	1.46	2.96	−0.03	70.34	43.38	103.12
Jewish autonomous region	−2.70	−0.01	−5.39	67.45	31.25	115.83
Kamchatka territory	−6.23	−4.58	−7.89	145.71	76.41	241.14
Magadan region	−1.69	3.88	−7.26	85.51	62.44	113.69
Primorie territory	1.96	1.86	2.05	85.27	80.82	89.86
Sakha Yakutia	−0.56	−2.14	1.03	14.90	4.18	24.37
Sakhalin region	−2.49	−1.51	−3.47	27.24	14.76	41.26
Khabarovsk territory	4.05	2.71	5.38	50.75	60.64	41.69
Chukotka autonomous region	−1.69	−0.55	−2.82	59.03	69.22	45.47

15.5 Conclusions

The findings indicate that duties paid on the Russian side of the border account for most of the bilateral tariff barriers between RFE and NEA. In particular, duties imposed on RFE exports in Russia were the largest contributors to tariff barriers. Furthermore, our calculations show that despite similar tariff barriers between RFE and NEA countries, the highest tariff impediments were revealed in RFE trade with Japan.

This study evaluated the comparative institutional barriers to trade between RFE and NEA countries by decomposing total trade costs represented by the border effects. Using South Korea as a benchmark, we showed that institutional barriers to RFE's trade with China declined, while those with Japan rose. In other words, in terms of RFE trade, we detect a process of convergence between China and Korea and divergence with Japan. In 2002–2017, the institutional barriers to trade between the RFE and China almost halved, whereas those with Japan almost doubled. Several factors could explain the rise in institutional barriers to trade between RFE and Japan. Export volumes of forest products have dropped over time due to an insufficiently balanced government policy of trying to increase the share of wood processing in RFE, which prompted Japanese importers of timber to look for alternative suppliers, and RFE timber exporters to seek opportunities in other countries. The Russian

government has toughened the rules for importing right-hand-drive cars from Japan, which have been the most popular automobiles on the RFE market. Moreover, the results might overestimate the institutional barriers due to the existence of a shadow sector in RFE supplying fish products to the Japanese market without being accounted for by the statistical authorities. Last but not least, the exchange rate policy of Russia over the period 2014–2017 had a negative impact on the purchasing power of the population, leading to a drop in demand for imports in the high-price category, like those from Japan.

For most RFE regions, institutional barriers with China have declined, indicating an intensification of trade relations between RFE and China. In general, China has inevitably emerged as an intermediary and an indispensable factor in the trade of RFE regions with Japan. Russian raw materials are processed in China and exported to the Japanese market. Japanese companies produce goods in China and export them to the Russian market. A similar model of economic interactions certainly exists for South Korea, but so far on a much smaller scale.

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