

JEL: F14, F15, R11

УДК 339+332

DOI: [10.14530/se.2018.4.021-038](https://doi.org/10.14530/se.2018.4.021-038)

TRADE POTENTIAL AND TRADE INTEGRATION OF THE RUSSIAN FAR EAST: A REGIONAL PERSPECTIVE

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Abstract. Over the past decade, the Russian government has embarked on an ambitious program of economic development in the Russian Far East (RFE), envisioning the transformation of the region into a hub for trade with the Asia Pacific. This paper explores the extent of RFE's trade integration with both key partners around the world and the rest of Russia. In particular, we calculate the region's trade potential on the basis of mean predicted values from a gravity model using three samples that offer different perspectives. Actual trade flows are then evaluated relative to the potential and the resulting index is analyzed for various years and countries. Based on the findings of the paper, we can draw several conclusions. First, RFE exports to Northeast Asia have intensified over the period 2008–2017, allowing the region to surpass its potential, although there seems to be room to grow with respect to China. The Russian government could facilitate cross-border trade by further reducing non-tariff barriers and improving transnational infrastructure links. Second, the deepening integration with Northeast Asia has been achieved at the expense of trade links with the rest of Russia. This might appear worrisome, given the geostrategic importance of RFE for Russia. At the same time, it might simply reflect the fact that RFE's natural resource exports are increasingly diverted to the Asia Pacific, which is more efficient than to ferry them to Western Russia, where they might end up being re-exported to Europe. Similarly, it might be more efficient for RFE to import from China than from more distant parts of Russia. Third, imports from Japan and Korea are far below potential, although these two countries can play a key role in promoting the economic development of RFE.

Keywords: trade, trade potential, trade integration, regional trade, Russian Far East, Russia

For citation: Tochkov K. Trade Potential and Trade Integration of the Russian Far East: A Regional Perspective. *Prostranstvennaya Ekonomika* = *Spatial Economics*. 2018. No. 4. Pp. 21–38. DOI: [10.14530/se.2018.4.021-038](https://doi.org/10.14530/se.2018.4.021-038). (In Russian).

1. INTRODUCTION

In the three decades since the end of the Cold War, trade has been celebrated as an engine of economic growth and countries around the world have been encouraged to liberalize their trade relations, open their markets, and negotiate free trade agreements. Empirical evidence based on various country samples, time periods, and model specifications has lent support to this argument by showing that trade openness can facilitate the diffusion of knowledge and technology, improve efficiency, raise productivity, and promote growth (for surveys of the literature, see, for instance: Edwards, 1993; Rodriguez, Rodrik, 1999; Singh, 2010). Trade liberalization can also be employed at the subnational level to foster regional economic development. Such place-based policies could either target specific regions that are lagging behind or they could be part of an unbalanced growth strategy that favors more advanced regions in the hope of spillover effects. An example of the latter are China's Special Economic Zones (SEZ) that have generated local growth by attracting foreign investment, setting up export-oriented industries, and deepening their integration with world markets (Wang, 2013). Other emerging economies, such as India, have also established regional SEZs hoping to replicate China's success (Alkon, 2018).

This paper focuses on exploring the extent of trade integration of the Russian Far East (RFE) with the world and the rest of Russia. RFE is a federal district of Russia bordering China and the Asia-Pacific region¹. It has a large territory (36% of Russia's total) and is rich in natural resources but low living standards and persistent outmigration have decimated the already sparse population and labor force. The central government declared the economic development of RFE a national priority and established a special federal ministry in 2012 tasked with promoting the economic and social advancement of the district. But the implicit motives behind this strategy were linked to the need of expanding Russia's trade with Northeast Asia via RFE following the slump in European demand caused by the global financial crisis (Minakir, 2017). Besides megaprojects like the "Power of Siberia" gas pipeline, a number of regional cooperation agreements were signed between RFE and China aimed at improving cross-border infrastructure and attracting Chinese investment in the region (Izotov, 2014). Recently, the federal government, hoping to boost RFE's trade openness and industrial capacity, introduced several place-based programs inspired by SEZ. Vladivostok, the district's largest city, was declared a free port, while Territories of Accelerated Socioeconomic Development (TOSER) offer various incentives,

¹ In November 2018, two regions from the Siberian federal district were transferred to RFE. In this paper, we refer to the RFE in existence prior to this change.

such as significant tax breaks and simplified customs procedures, to domestic and foreign investors who develop export-oriented industries with higher value-added (Leonov, 2017; Min, Kang, 2018).

The broad objective of this paper is to investigate empirically the trade relations of RFE as the crossroads between Russia and the Asia-Pacific region. Specifically, we study whether RFE is living up to its export and import potential, which, as described above, is central to the government's strategy for economic development of the region. For this purpose, we first estimate a gravity model using trade flows between RFE, Russia, and their major trading partners over the period 2008–2017. The estimated coefficients are then used to predict RFE's trade potential. Next, we set this trade potential in relation to the actual trade flows and assess changes in the resulting index across trading partners and years. This approach allows us to explore whether RFE reaches its trade potential, which, in turn, offers insights into the extent of trade barriers. Furthermore, we can use our findings to evaluate the degree of RFE's integration with its trading partners. The estimation is conducted using two different specifications of the model. In addition, three samples help us derive different benchmarks for the calculation of the trade potential. Last but not least, we evaluate trade integration both at the intranational (between RFE and Russia) and international levels.

The literature on trade potential was initially inspired by the upcoming enlargement of the European Union (EU) in the 1990s. Trade flows of candidate states from Central and Eastern European (CEE) were juxtaposed with the trade patterns of existing EU members to estimate possible gains from expanding the common market (Baldwin, 1994; Gros, Gonciarz, 1996; Nilsson, 2000; Papazoglou et al., 2006). Since then, the literature has expanded to cover single nations: India (Kumar, Prabhakar, 2017), Ireland (Brulhart and Kelly, 1999), Kazakhstan (Nurseit, 2014), Pakistan (Atif et al., 2017) and groups of countries: Arab states (Salim et al., 2011), ASEAN (Chen et al., 2017), CIS (Shepotylo, 2013). The framework has also been applied to Russia in the context of potential gains from WTO membership (Babetskaia-Kukharchuk, Maurel, 2004). To the best of our knowledge, no existing studies have estimated the trade potential at the subnational level.

The paper is structured as follows. The next section presents the gravity model used in the empirical investigation and discusses various estimation strategies. Section 3 describes the data and presents descriptive statistics. Section 4 reports the results of the regression and the estimated indices of trade potential. Section 5 summarizes the findings and draws conclusions.

2. METHODOLOGY

The gravity model, which is widely used in the trade literature, postulates that trade flows between two countries are a function of three groups of factors which account for the traits of the exporter and importer, as well as for components that either facilitate or impair trade relations between them. Accordingly, a stochastic representation of the model can be defined as follows:

$$X_{ij} = \beta_0 Y_i^{\beta_1} Y_j^{\beta_2} T_{ij}^{\beta_3} \varepsilon_{ij}, \quad (1)$$

where X_{ij} stands for the exports of country i to country j , which is proportional to the aggregate output of country i (Y_i), aggregate expenditure of country j (Y_j), and bilateral trade costs (T_{ij}). ε_{ij} denotes the error term, which has an expected value of 1 and is assumed to be independent of the regressors. The aggregate output of the exporting country serves as a proxy for the size of its economy, accounting for total potential supply of goods, and is thus expected to have a positive effect on exports. The aggregate expenditure of the importing country reflects total potential demand for goods, which is also predicted to have a positive impact. The third variable, trade costs, is a broad category that can include geographic as well as policy-based factors. The anticipated sign of the variable depends on which factors are included in the model. Geographical distance between the trading partners, the presence of high mountains or deserts on the trade routes, and landlockedness would obviously impair trade relations, while geographic proximity and access to waterways would have the opposite effect. Moreover, low tariffs and non-tariff barriers, free trade agreements, cultural and political ties, and shared history and language can facilitate trade between countries.

The usual approach in the literature is to linearize Eq. (1) by taking natural logs. The resulting equation is given by:

$$\ln X_{ij} = \ln \beta_0 + \beta_1 \ln Y_i + \beta_2 \ln Y_j + \beta_3 \ln T_{ij} + \ln \varepsilon_{ij}. \quad (2)$$

Trade costs are generally broken down into various components that are measured either quantitatively (e. g., distance) or via dummy variables (e. g., the presence of a free trade agreement, or the lack thereof). The estimation strategy typically employs OLS. However, Anderson and Van Wincoop (2003) show that OLS estimates are biased, if the model does not account for trade hurdles between the two trading countries and their other trading partners not involved in the given bilateral exchange. These so-called multilateral resistance terms can be estimated via fixed effects in a panel regression (Rose and Van Wincoop, 2001), and indeed fixed-effect models have become standard in the gravity literature.

We adopt the specification in Eq. (2) and adapt it to the objectives of the paper as follows:

$$\ln X_{ijt} = \ln \beta_0 + \beta_1 \ln Y_{it} + \beta_2 \ln Y_{jt} + \beta_3 \ln D_{ij} + \beta_4 \text{CONT}_{ij} + \beta_5 \text{HOME}_{ij} + \alpha_i + \alpha_j + \eta_t + \ln \varepsilon_{ijt}. \quad (3)$$

The dependent variable is the log of exports (in real terms), while the dependent variables include the aggregate output of the exporting and importing country proxied by their corresponding real GDP. Trade costs are broken down into bilateral distance (D_{ij}), a dummy variable for contiguity (CONT_{ij}), and a dummy variable for home bias (HOME_{ij})¹. The coefficients for economic size and contiguity are expected to be positive, while the one for distance is predicted to have a negative effect on trade. Home bias has been shown to result in intranational trade flows being significantly higher than international trade (Evans, 2001; Wei, 1996). Furthermore, Eq. (3) takes into account factors that vary across countries but not across time via exporter and importer fixed effects (α_i and α_j , respectively). Similarly, factors that vary across time but not across countries are controlled for by including time-fixed effects (η_t).

Santos Silva, Tenreyro (2006) argue that OLS estimates of log-linearized models like the one in Eq. (3) produce biased estimates in the presence of heteroscedasticity. Although fixed effects control for heteroscedasticity, the log-linearization could still generate misleading results. Santos Silva, Tenreyro (2006) suggest instead estimating the gravity equation in levels by employing Pseudo Poisson Maximum Likelihood (PPML). This technique has since become a standard approach in the gravity literature to deal with the problem of heteroscedasticity². Accordingly, we test the robustness of our results by using both the traditional OLS specification with fixed effects and PPML to estimate Eq. (3).

In the second step of the analysis, we calculate the fitted value of exports for a given country on the basis of the estimated coefficients from Eq. (3). The resulting number is the mean predicted value from the sample, which can be interpreted as the export potential of the country. More importantly, it can serve as a benchmark to evaluate actual exports relative to their potential. For this purpose, we follow De Benedictis, Vicarelli (2005) and define an index given by:

¹ The home bias variable takes the value of one, if the trade flows occur within a country, and zero, if it denotes cross-border trade. This is an important variable when dealing with intranational trade between RFE and Russia.

² An added advantage of PPML is that it can handle zero trade flows, unlike the log-linearized model. At the same time, zero flows are not an issue in our dataset.

$$Z_{ijt} = \frac{e^{\ln X_{ijt}}}{e^{\widehat{\ln X_{ijt}}}}, \quad (4)$$

where $\widehat{\ln X_{ijt}}$ is the fitted value of exports from country i to country j generated by Eq. (3)¹. A value of one indicates that actual exports match the mean predicted value and therefore the export potential has been reached. Values less than one signal that the level of exports is below potential, while values above one imply that exports outperform the mean levels predicted by the sample.

3. DATA

Data on Russia's bilateral trade flows over the period 2008–2017 are collected from the IMF's Direction of Trade Statistics (DOTS) database. Two different sets of data are available due to separate reporting by the exporting and the importing nations. In the literature, the two sets are usually averaged, but we opt instead for the data reported by Russia to ensure consistency with the regional trade series for RFE. RFE's bilateral trade flows with foreign countries are obtained from Russia's Federal Customs Service, while its trade with the rest of Russia is measured using data from Russia's Federal State Statistical Service (FSSS). Twenty-nine trading partners included in the sample account for more than 85% of Russia's exports and imports over the sample period². RFE is added to the sample as the thirtieth trading partner. Therefore, Russia is now defined as an entity consisting of all of its regions bar the Russian Far East. All variables are adjusted accordingly and for the rest of the analysis we will refer to this new entity simply as Russia.

Bilateral trade flows are modeled as exports in line with Eq. (3) and are initially measured in current US dollars. We convert them in real terms (constant 2010 US dollars) by employing the index of export prices as deflator, which is reported by the Economist Intelligence Unit³. In the absence of a regional export price index, RFE's exports are deflated by its local Producer Price Index (PPI). Similarly, Russia's exports to RFE are deflated by Russia's national PPI, because these trade flows occur within the country.

Real GDP (in constant 2010 US dollars) is collected from the World Bank's

¹ In the PPML estimation, the dependent variable is in levels rather than logs, making it unnecessary to use exponentials.

² The 29 trading partners include EU member states (Austria, Belgium, Czech Republic, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Spain, Netherlands, Poland, Slovakia, Sweden, and the UK), Asian countries (China, India, Japan, South Korea, Taiwan), CIS member states (Belarus, Kazakhstan, Ukraine), Turkey, Brazil, USA, and Switzerland.

³ The export price indices of Belarus and Ukraine are taken from their respective national statistical offices.

World Development Indicators database¹. RFE's nominal output is converted in 2010 prices with the help of real growth rates provided by FSSS². The distance variable is gathered from CEPII's GeoDist dataset, which defines it as great-circle distance between the most populous metropolitan areas of each country. Applying the same principle, RFE's distances to its trading partners are based on distances from the city of Vladivostok.

The descriptive statistics for cumulative exports and imports of Russia and RFE over the period 2008–2017 are shown in table 1.

Table 1

**Russia's and RFE's cumulative trade (millions of current US dollars),
2008–2017**

Trading partners	Russia (without RFE)				RFE			
	Exports	%	Imports	%	Exports	%	Imports	%
1	2	3	4	5	6	7	8	9
Austria	9975	0,26	26 963	1,15	75,3	0,04	238,5	0,30
Belarus	176 205	4,66	110 233	4,72	103,9	0,05	753,9	0,93
Belgium	42 782	1,13	32 485	1,39	18 022,2	8,59	296,0	0,37
Brazil	19 239	0,51	35 076	1,50	14,3	0,01	980,9	1,21
China	253 263	6,69	383 506	16,41	40 126,5	19,12	35 900,2	44,43
Czech Rep.	42 727	1,13	36 586	1,57	3,8	0,00	57,3	0,07
Finland	105 141	2,78	43 751	1,87	61,1	0,03	702,3	0,87
France	81 433	2,15	93 647	4,01	67,1	0,03	1247,9	1,54
Germany	263 489	6,96	282 958	12,11	301,0	0,14	1614,4	2,00
Greece	36 211	0,96	4183	0,18	1,5	0,00	14,7	0,02
Hungary	51 461	1,36	26 713	1,14	0,2	0,00	131,3	0,16
India	51 929	1,37	24 597	1,05	5388,9	2,57	334,2	0,41
Italy	269 832	7,13	107 706	4,61	29,2	0,01	826,0	1,02
Japan	71 994	1,90	93 158	3,99	61 876,2	29,48	11 022,7	13,64
Kazakhstan	112 694	2,98	52 721	2,26	327,7	0,16	85,3	0,11
Latvia	72 664	1,92	5676	0,24	2,5	0,00	13,3	0,02
Lithuania	39 765	1,05	8616	0,37	3,7	0,00	6,1	0,01
Netherlands	526 930	13,92	44 623	1,91	102,8	0,05	494,5	0,61
Poland	152 015	4,02	58 740	2,51	6,4	0,00	144,4	0,18
Slovakia	43 357	1,15	24 315	1,04	0,7	0,00	8,7	0,01
Spain	41 292	1,09	35 387	1,51	4,8	0,00	379,4	0,47
South Korea	54 812	1,45	67 714	2,90	65 126,2	31,02	9783,4	12,11
Sweden	37 800	1,00	28 934	1,24	12,7	0,01	200,8	0,25
Switzerland	65 604	1,73	24 921	1,07	1,428,3	0,68	51,7	0,06

¹ The data for Taiwan is sourced from Taiwan's Directorate-General of Budget, Accounting and Statistics.

² The latest gross regional product data is for 2016, compelling us to extrapolate the level for 2017.

1	2	3	4	5	6	7	8	9
Taiwan	24 767	0,65	16 144	0,69	1363,7	0,65	533,0	0,66
Turkey	195 112	5,16	49 810	2,13	41,2	0,02	174,7	0,22
Ukraine	154 681	4,09	117 435	5,02	765,2	0,36	157,8	0,20
UK	107 378	2,84	54 903	2,35	471,7	0,22	1118,1	1,38
USA	112 935	2,98	123 338	5,28	951,2	0,45	6301,3	7,80
Total	3 217 487	85,0	2 014 839	86,2	196 680	93,69	73 573	91,06
Europe	1 989 857	52,6	941 107	40,3	20 595	9,8	7546	9,3
Asia	404 836	10,7	560 523	24,0	173 882	82,8	57 574	71,3
CIS	443 580	11,7	280 389	12,0	1177	0,6	325	0,4

Source: IMF's Direction of Trade database, Russia's Federal Customs Service, and Belarus' National Statistical Committee.

RFE's trade is only a tiny fraction of Russia's exports (6%) and imports (3.7%). Moreover, the two entities differ markedly in the geographic structure of their trade relations. Russia trades predominantly with Europe (40–50%), while RFE's foreign economic relations are focused intensely on East Asia (70–80%). Geographic proximity certainly explains in part these patterns. However, only an empirical investigation can determine whether these levels of trade match RFE's potential.

4. RESULTS

The sample is divided into three groups. The Russia sample includes Russia's bilateral trade with foreign countries and RFE, while the RFE sample consists of the region's bilateral trade interactions with Russia and the world. The total sample combines the trade flows of Russia and RFE with the world and among themselves. First, we estimate the gravity model for each of the three samples, followed by calculations of RFE's trade potential with respect to various countries.

4.1. Gravity estimates

The results of the gravity model estimation are presented in table 2. For each sample we estimate two specifications ((1) OLS with fixed effects and (2) PPML) to test the robustness of the estimates. The goodness-of-fit is very high, while coefficients have mostly the expected signs and attain statistical significance across models and samples. The size of the exporting and importing economies has a large and significant positive effect on trade as anticipated, with the exception of the RFE sample where the exporting country's GDP does not attain statistical significance at conventional levels.

Table 2

Gravity model estimates

Variables	Russia sample		RFE sample		Total sample	
	(1)	(2)	(1)	(2)	(1)	(2)
$\ln Y_i$	0,609*** (0,229)	0,958*** (0,146)	-0,960* (0,543)	0,225 (0,479)	1,726*** (0,052)	0,934*** (0,042)
$\ln Y_j$	1,111*** (0,210)	1,030*** (0,138)	0,507*** (0,168)	1,017** (0,447)	1,047*** (0,032)	0,968*** (0,039)
$\ln D_{ij}$	-1,764*** (0,357)	-1,626*** (0,239)	-1,612*** (0,379)	-2,398** (0,976)	-1,582*** (0,070)	-1,199*** (0,070)
$CONT_{ij}$	1,476*** (0,230)	1,413*** (0,166)	1,757*** (0,649)	-0,363 (1,579)	0,840*** (0,245)	1,738*** (0,145)
$HOME_{ij}$	3,857*** (0,910)	3,455*** (0,597)	3,727*** (0,801)	5,673*** (2,040)	4,032*** (0,410)	2,711*** (0,206)
Constant	-17,918*** (7,313)	-24,939*** (6,198)	40,577*** (15,606)	2,250 (16,372)	-46,454*** (2,118)	-26,017*** (1,708)
Obs.	600	600	573	573	1153	1153
R^2	0,93	0,95	0,85	0,91	0,87	0,95

Note: Model (1) refers to OLS with fixed effects. Model (2) is estimated using PPML. All specifications include exporter, importer, and time fixed effects. Robust standard errors are in parentheses. * $p < 0,10$; ** $p < 0,05$; *** $p < 0,01$.

Distance represents a serious hurdle to trade as illustrated by the high magnitude, statistical significance, and negative sign of the corresponding coefficient. By contrast, contiguity has a positive and significant effect on trade except for the PPML estimates in the RFE sample. The substantial size of the home bias coefficient suggests that intranational trade between Russia and RFE is significantly higher than with other countries.

The estimates are generally consistent across model specifications and samples. However, OLS estimates exhibit larger magnitudes than PPML, especially in the Russia sample and the total sample. Given the bias of OLS estimates in the presence of heteroscedasticity and the advantages of PPML as described in the methodology section, we choose to employ the latter estimates in the calculations of the trade potential.

4.2. Estimates of trade potential

We focus first on RFE's trade potential with respect to foreign countries using the coefficients from the RFE sample and the total sample. The annual indices of export potential are shown in table 3. The numbers in the left panel evaluate RFE's actual exports to a given country relative to the mean predicted value of exports to all of RFE's major trading partners. In that sense, the average across countries and years of 1,03 suggests that RFE is exporting slightly above its estimated potential. However, this conceals considerable variation in sample.

In the early years, the export potential is below unity meaning that RFE was underperforming. The levels increase gradually, though not linearly, reaching values of around 1,5 in the period 2015–2017. In other words, RFE has managed to attain and exceed its potential in a matter of a decade.

Table 3

Estimates of export potential based on RFE’s trade with the world, 2008–2017

Year	RFE sample							Total sample						
	All	CHN	JPN	KOR	EU	CIS	ROW	All	CHN	JPN	KOR	EU	CIS	ROW
2008	0,41	0,45	0,51	0,69	0,27	0,09	0,57	0,22	0,29	0,65	0,83	0,11	0,07	0,06
2009	0,96	1,06	0,84	0,90	0,69	0,16	0,62	0,41	0,77	1,17	1,21	0,21	0,88	0,16
2010	0,69	0,85	0,95	0,83	0,56	0,04	0,44	1,40	0,58	1,25	1,05	2,14	0,06	0,45
2011	1,03	0,83	0,84	0,95	1,39	0,02	0,33	1,55	0,56	1,08	1,18	2,19	0,04	0,43
2012	0,79	0,98	0,91	0,99	0,88	0,33	0,48	0,99	0,51	0,91	0,95	1,26	0,42	0,44
2013	1,08	0,93	1,07	0,94	1,03	3,13	0,49	1,20	0,52	1,14	0,97	1,58	1,05	0,37
2014	0,84	0,96	1,11	1,10	0,61	2,06	1,14	1,28	0,60	1,30	1,25	1,73	0,68	0,48
2015	1,41	1,10	1,44	1,19	1,80	1,67	1,10	2,05	0,92	2,27	1,82	3,13	0,70	0,83
2016	1,61	1,21	1,24	1,12	1,35	3,42	1,25	3,80	1,12	2,16	1,90	4,66	5,37	1,56
2017	1,53	1,36	1,12	1,25	1,63	2,50	1,19	2,71	0,95	1,47	1,59	3,56	2,63	0,85
Mean	1,03	0,97	1,00	0,99	1,02	1,34	0,76	1,56	0,68	1,34	1,27	2,06	1,19	0,56

Note: The numbers represent the ratio of actual to potential exports based on the estimated parameters of the PPML model in table 2. RFE sample includes the region’s exports to the world; Total sample includes both RFE’s and Russia’s trade with the world. EU = European Union member states and Switzerland. CIS = Belarus, Kazakhstan, and Ukraine. ROW = rest of the world includes all countries in the sample except for China (CHN), Japan (JPN), Korea (KOR), and Russia.

As table 1 showed, China, Japan, and South Korea are by far the most important trading partners of RFE. Nevertheless, the export potential with these countries was reached only in 2013–2015. The continuous increase in the export index for China over the period 2013–2017 and the gradual decline in the case of Japan might reflect the impact of Western sanctions following the Ukrainian crisis of 2014 and Russia’s ensuing intensification of trade relations with China. In recent years RFE has exceeded its export potential with EU member states, despite the fact that these countries are less relevant as trading partners. No single country within the EU seems to be driving the results. The general picture is of rather low indices for most years interspersed with high performances in a few given years without a clear pattern. Belgium is an exception in that RFE’s export potential begins at almost zero in 2008 and increases steadily to 1,8 in 2017. With regards to CIS, RFE’s exports are far below their potential until 2013 when a dramatic reversal occurs with actual exports exceeding projected ones by a factor of between two and three. This is propelled initially by exports to Ukraine but Belarus and Kazakhstan are responsible for the high levels in the last two years

of the sample. Lastly, RFE underperforms with respect to most other countries, although India and Brazil exceed unity in four of the ten years in the sample.

The right panel of table 3 displays the results for the total sample. RFE's export potential is now assessed against a benchmark derived from RFE's and Russia's trade with the world. In other words, Russia's trade patterns are now reflected in the mean predicted value, broadening the scope of comparison to include interactions between large economies. The most interesting changes in the estimates occur with respect to RFE's Northeast Asian neighbors. RFE's actual exports to China are now on average only 68% of the predicted mean value, whereby the trade potential is reached only in 2016. By contrast, exports to Japan and Korea surpass the potential in eight of the ten years of the sample. This result suggests that RFE as a region of Russia is not using its full potential for exports to China but its performance with respect to Japan and Korea is outstripping expectations. The high indices for Europe are determined almost entirely by excessive exports to Belgium, while nearly all other EU countries record levels far below potential¹. Similarly, the rest of the world reaches the dismal level of 0,56 only thanks to RFE's exports to India exceeding unity in almost all years.

Next, we turn our attention to RFE's import potential presented in table 4. In the RFE sample, actual imports outstrip projected ones in six of the ten years, while in the total sample the indices are generally higher and exceed unity in every year of the sample. There is no clear increasing or decreasing tendency over time in either of the samples but estimates vary across countries. Judging by the RFE sample benchmark, imports from RFE's Northeast Asian neighbors reach potential levels only for 3–4 years and mostly in the period 2012–2014. In the last three years, all three countries underperform, which is also reflected in the average indices for the entire sample period. Adding Russia's trade with the world changes the picture dramatically. Against the new benchmark, imports from China exceed the predicted mean levels by a factor of 2 on average and do not drop below 1,5 in any given year, although a decline can be detected in the last three years. Japan and Korea, on the other hand, exhibit dismally low levels of 70% below potential on average.

As with exports, no single EU country dominates the results for the RFE sample. But in the total sample, indices, which are much higher and never dip below unity, are largely driven by imports from Finland, and to a lesser extent Poland and the UK. Similarly, the levels for CIS do not match the projected level in most years in the RFE sample, but are extremely high in the total sample, which is mostly due to imports from Belarus. For the remaining countries in the sample, the switch of benchmark reduces dramatically trade potentials. In the

¹ When Belgium is excluded from the total sample, the average index for the EU drops to 0,31.

RFE sample, Brazil and Taiwan achieve higher import potentials, propelling levels for the group to above unity for the later years of the sample period. In the total sample, imports from the US are the only ones consistently exceeding unity in all years.

Table 4

Estimates of import potential based on RFE's trade with the world, 2008–2017

Year	RFE sample							Total sample						
	All	CHN	JPN	KOR	EU	CIS	ROW	All	CHN	JPN	KOR	EU	CIS	ROW
2008	0,80	0,94	2,30	0,64	0,76	0,33	0,72	1,18	2,61	0,69	0,21	1,41	0,53	0,56
2009	0,85	0,89	0,58	0,57	0,90	0,52	0,89	1,55	2,31	0,18	0,19	1,66	3,05	0,72
2010	1,01	1,17	0,65	0,86	1,12	0,73	0,85	2,92	3,03	0,21	0,29	3,41	6,27	0,61
2011	0,80	0,99	0,61	1,05	0,81	0,80	0,69	1,83	2,68	0,22	0,38	1,69	7,79	0,54
2012	0,93	1,05	0,66	1,55	0,91	1,22	0,96	1,88	2,12	0,19	0,44	1,79	9,09	0,49
2013	1,08	1,15	1,19	1,12	1,10	0,87	1,14	2,39	2,40	0,36	0,34	2,80	4,87	0,59
2014	1,05	1,05	1,44	0,97	1,14	0,40	1,05	2,01	2,16	0,45	0,30	2,46	3,05	0,64
2015	1,17	0,84	0,99	0,66	1,29	0,74	1,25	1,80	1,69	0,31	0,20	1,35	7,24	0,96
2016	1,06	0,83	0,58	0,99	0,86	2,08	1,36	1,96	1,69	0,19	0,32	1,13	9,77	1,19
2017	1,32	0,91	0,73	1,29	1,14	2,97	1,28	2,35	1,53	0,21	0,35	2,61	5,37	0,90
Mean	1,01	0,98	0,97	0,97	1,00	1,07	1,02	1,99	2,22	0,30	0,30	2,03	5,70	0,72

Note: The numbers represent the ratio of actual to potential imports based on the estimated parameters of the PPML model in table 2. RFE sample includes the region's exports to the world; Total sample includes both RFE's and Russia's trade with the world. EU = European Union member states and Switzerland. CIS = Belarus, Kazakhstan, and Ukraine. ROW = rest of the world includes all countries in the sample except for China (CHN), Japan (JPN), Korea (KOR), and Russia.

The last part of the analysis deals with RFE's trade potential in intranational trade with Russia. Besides the RFE sample and the total sample, we now also include the Russia sample and show the results in table 5.

The Russia sample establishes Russia's trade with the world as a benchmark, allowing us to assess how well RFE is integrated with the rest of Russia relative to Russia's main trading partners. Russia's imports in columns 3 and 4 of table 5 represent RFE's export performance. Although RFE and the rest of the world reach the export potential in most years, the former exhibits higher indices, especially since 2013. In terms of imports, the results in columns 1 and 2 suggest that RFE does not perform as well because the rest of the world exceeds unity in seven out of the ten years, almost twice as much as RFE.

The RFE and total samples reveal very similar patterns. RFE's export performance with Russia declines steadily over the years, from a high of 1,5 in 2008 to a low of 0,3 in 2017. The rest of the world exhibits exactly the reverse tendency, rising from 0,3–0,4 at the start of the sample period to 1,5–1,8 ten years later. These numbers signal that RFE's integration via exports to Russia has been

diminishing over time, dropping below potential in 2012–2014. This process was countered by deeper export relations with the rest of the world, which contributed to attaining and exceeding the potential level in 2013–2014. The pattern for imports is similar, although the change is less linear. The index for Russia declines in both samples but matches potential in 2015–2016 before dropping again. Imports from the rest of the world attain unity in 2012 and continue growing in the RFE sample, while they are consistently above unity throughout the sample period in the total sample.

Table 5

Estimates of RFE's trade potential based on intranational trade with Russia, 2008–2017

Year	Russia sample				RFE sample				Total sample			
	Exports		Imports		Exports		Imports		Exports		Imports	
	RU	ROW	RFE	ROW	RU	ROW	RU	ROW	RU	ROW	RU	ROW
2008	1,32	1,01	0,85	1,00	1,53	0,43	1,50	0,95	1,58	0,34	1,41	1,00
2009	1,32	1,02	0,82	0,95	1,38	0,71	1,25	0,72	1,56	0,73	1,24	1,35
2010	0,89	1,05	1,08	1,06	1,31	0,61	0,96	0,90	1,39	0,92	0,99	2,30
2011	0,36	1,01	0,81	0,96	1,34	0,73	0,97	0,83	1,40	0,91	1,08	2,22
2012	0,89	0,93	1,12	0,92	1,18	0,76	0,90	1,06	0,96	0,75	0,78	2,35
2013	1,48	1,03	0,87	1,00	1,10	1,26	0,85	1,10	0,95	0,94	0,78	1,89
2014	0,83	0,97	1,49	1,05	0,92	1,16	0,86	1,01	0,88	1,01	0,82	1,51
2015	0,50	1,01	1,33	1,07	0,48	1,38	1,00	0,96	0,61	1,61	0,98	1,96
2016	1,47	1,02	1,05	1,00	0,36	1,60	0,96	1,12	0,51	2,79	1,00	2,38
2017	0,59	0,95	1,14	1,00	0,35	1,51	0,86	1,39	0,37	1,84	0,78	1,83
Mean	0,97	1,00	1,05	1,00	1,00	1,02	1,01	1,00	1,02	1,18	0,99	1,88

Note: The numbers represent the ratio of actual to potential trade based on the estimated parameters of the PPML model in table 2. Russia sample includes Russia's trade, RFE sample includes the region's trade; Total sample includes both RFE's and Russia's trade. RU = Russia (without RFE). ROW = rest of the world includes all countries in the sample except for Russia. Exports (imports) refer to RFE's exports to (imports from) RU or ROW, except for the Russia sample where they refer to Russia's trade with RFE and ROW.

Lastly, figure visualizes RFE's export and import performance vis-à-vis its main trading partners in selected years. Trade potential is estimated using the benchmark from the total sample. It is obvious that RFE's actual exports to Russia are on a downward trajectory over the sample period, eventually dropping below potential. By comparison, export relations with Northeast Asia seem to be on the rise, getting either close to potential (China) or exceeding the potential (Japan and Korea) in recent years. Imports from Russia reveal a similar picture, although the decline in performance is not as dramatic as for exports. Despite the fact that RFE records a drop in the import index for China, actual imports still remain above potential. Japan and Korea, on the other hand, remain far below potential imports.

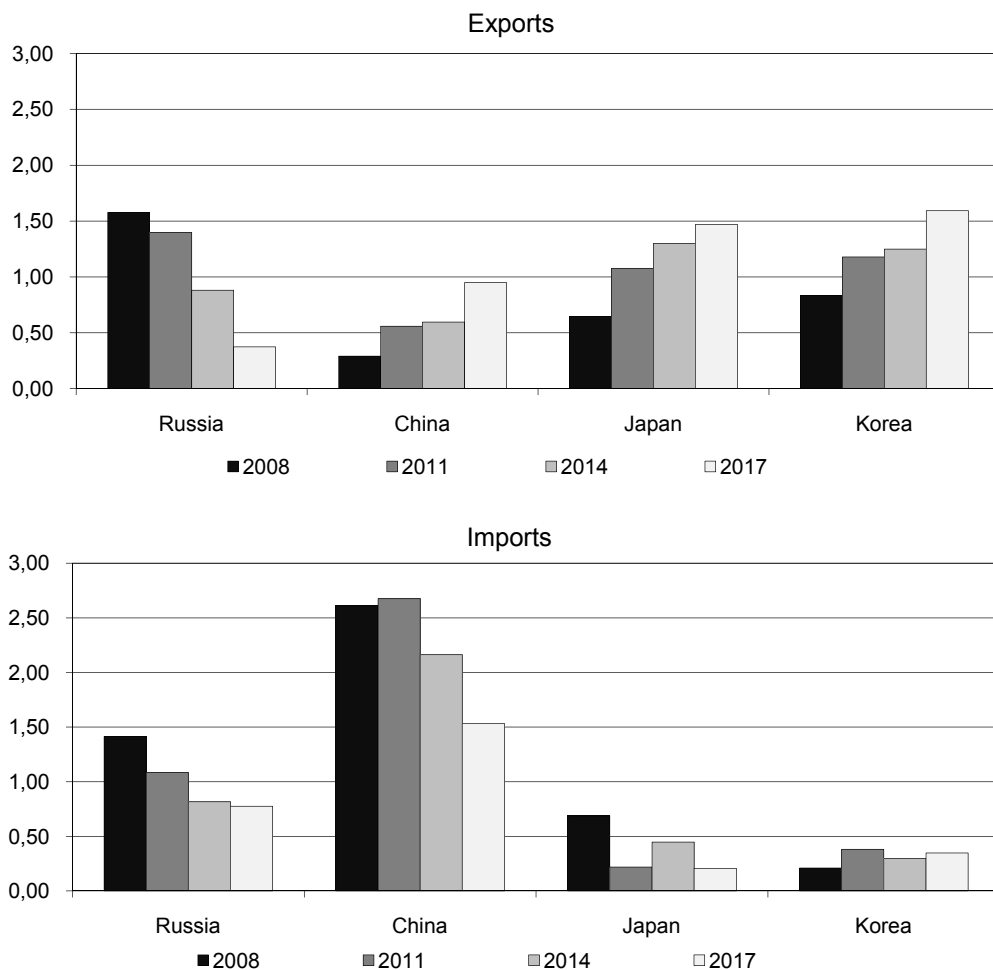


Fig. RFE's trade potential with major trading partners in selected years

Note: The bars represent the ratio of actual to potential trade based on the estimated parameters of the PPML model in table 2 using the total sample.

5. CONCLUSION

Over the past decade, the Russian government has embarked on an ambitious program of economic development in RFE, envisioning the transformation of the region into a hub for trade with the Asia-Pacific area. On the one hand, RFE with its abundance of natural resources and its geographic proximity has some prerequisites to become integrated with the dynamics markets of Northeast Asia. On the other hand, its dwindling labor force, small market size, and onerous bureaucratic procedures are likely to discourage cross-border trade and

investment. The question then becomes what RFE's potential for trade integration with its neighbors is and whether the region's effective trade flows live up to this potential. Another concern is the effect of a deeper integration with the Asia Pacific on RFE's trade relations with the rest of Russia.

The paper addresses these issues by conducting an empirical investigation of RFE's trade flows with its major trading partners over the period 2008–2017. The trade potential is calculated on the basis of mean predicted values from a gravity model using three samples that offer different perspectives. Actual trade flows are then evaluated relative to the potential and the resulting index is analyzed for various years and sets of countries, allowing us to explore patterns and tendencies of RFE's exports and imports.

When viewed in isolation, as a separate entity trading with countries around the world, including Russia, RFE's export performance with respect to Northeast Asia shows consistent improvement over time. While initially exports fall short of the potential, they exceed it in the last few years of the sample period. In the more realistic scenario, where Russia is added to the sample as a trading entity in its own right alongside RFE, the pattern is similar, although there are differences between the three major foreign trading partners. Exports to China get increasingly closer to but almost never reach the benchmark, whereas exports to Japan and Korea surpass it in nearly all years. For most other destinations, RFE exports rarely exceed the potential, and when they do, the dynamics are usually not consistent over time.

The results for imports paint a different picture. By the standards of the RFE sample, imports from the three Northeast Asian countries overperform only over the period 2012–2014. But once the sample broadens to include Russia's trade with the world, RFE imports from China are almost 2–3 times larger than the potential, while those from Japan and Korea barely exceed 30% of this benchmark. Imports from other countries, like Finland and Belarus, exhibit considerably higher efficiency.

The estimates of the gravity model show unequivocally that there is a strong home bias in trade relations between RFE and the rest of Russia. However, regardless of the sample, RFE exports exceed their potential only until 2012–2013, after which they drop sharply. This tendency is a mirror image of the changes in RFE exports to the rest of the world. Imports from Russia underperform in most years of the sample, in contrast to those from the rest of the world.

Based on the findings of the paper, we can draw several conclusions. First, RFE exports to Northeast Asia have intensified over the period 2008–2017, allowing the region to surpass its potential, although there seems to be room to grow with respect to China. The Russian government could facilitate cross-border trade by further reducing non-tariff barriers and improving transnational

infrastructure links. Second, the deepening integration with Northeast Asia has been achieved at the expense of trade links with the rest of Russia. This might appear worrisome, given the geostrategic importance of RFE for Russia. At the same time, it might simply reflect the fact that RFE's natural resource exports are increasingly diverted to the Asia Pacific, which is more efficient than to ferry them to Western Russia, where they might end up being re-exported to Europe. Similarly, it might be more efficient for RFE to import from China than from more distant parts of Russia. Third, imports from Japan and Korea are far below potential, although these two countries can play a key role in promoting the economic development of RFE.

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ТОРГОВЫЙ ПОТЕНЦИАЛ И ТОРГОВАЯ ИНТЕГРАЦИЯ РОССИЙСКОГО ДАЛЬНЕГО ВОСТОКА: РЕГИОНАЛЬНАЯ ПЕРСПЕКТИВА

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Аннотация. В рамках текущего десятилетия руководство России осуществляет масштабную программу развития Дальнего Востока с целью трансформации экономики макрорегиона за счет интенсификации его торговых связей со странами АТР. В настоящем исследовании оценивается глубина торговой интеграции Дальнего Востока (макрорегиона) с зарубежными странами и регионами России. На основе оценки средних ожидаемых значений торговых взаимодействий в рамках трех модельных спецификаций гравитационной зависимости были определены значения торгового потенциала экономики Дальнего Востока. Полученные в результате расчетов отношения текущих значений торговых взаимодействий к потенциальным были декомпозированы по географической структуре торговли и времени. Полученные оценки позволили сформулировать следующие выводы. Во-первых, в 2008–2017 гг. наблюдалось увеличение экспорта макрорегиона в страны Северо-Восточной Азии (СВА), что позволило экономике Дальнего Востока превзойти свой торговый потенциал, при имеющейся возможности для расширения торговли с китайским рынком. Российское руководство может способствовать росту трансграничной торговли за счет снижения нетарифных барьеров и улучшения приграничной совместной транспортной инфраструктуры. Во-вторых, углубление интеграции со странами СВА было достигнуто за счет ослабления торговых взаимодействий с остальными российскими регионами, что на первый взгляд может вызвать беспокойство, учитывая геостратегическую важность Дальнего Востока для России. В то же время данное обстоятельство может являться констатацией все большей переориентации производимых на Дальнем Востоке сырьевых товаров на рынок АТР, в силу большей экономической эффективности по сравнению с их вывозом в западные регионы России, откуда, в конечном счете, они могут быть экспортированы в Европу. По этой же причине для экономики Дальнего Востока может быть более эффективно наращивание импорта из КНР, а не из территориально удаленных регионов России. В-третьих, для макрорегиона текущие стоимостные объемы импорта из Японии и Республики Корея существенно ниже потенциальных, несмотря на то, что данные страны могут играть ключевую роль в ускоренном развитии экономики Дальнего Востока.

Ключевые слова: торговля, торговый потенциал, торговая интеграция, региональная торговля, Россия, Дальний Восток