



# 2015 KIEP Visiting Fellows Program





---

The Korea Institute for International Economic Policy (KIEP) was founded in 1990 as a government-funded economic research institute. It is a leading institute concerning the international economy and its relationship with Korea. KIEP advises the government on all major international economic policy issues and serves as a warehouse of information on Korea's international economic policies. Further, KIEP carries out research by request from outside institutions and organizations on all areas of the Korean and international economies by request.

KIEP possesses highly knowledgeable economic research staff. Our staff includes many research fellows with PhDs in economics from international graduate programs, supported by dozens of professional researchers. Our efforts are augmented by our affiliates, the Korea Economic Institute of America (KEI) in Washington, D.C. and the KIEP Beijing office, which provide crucial and timely information on local economies. KIEP has been designated by the government as its Center for International Development Cooperation and the National APEC Study Center. KIEP also maintains a wide network of prominent local and international economists and business people who contribute their expertise on individual projects.

KIEP continually strives to increase its coverage and grasp of world economic events, and expanding cooperative relations has been an important part of these efforts. In addition to many joint projects in progress KIEP is aiming to become a part of a broad but close network of the world's leading research institutes. Considering the rapidly changing economic landscape of Asia, which is leading to further integration of the world's economies, we are confident that KIEP's win-win proposal for greater cooperation and sharing of resources and facilities will increasingly become standard practice in the field of economic research.

**HYUN Jung Taik**  
*President*

Korea Institute for International Economic Policy  
370 Sicheong-daero, Sejong-si, 30147, Korea  
Tel: (8244) 414-1251 Fax: (8244) 414-1144  
[www.kiep.go.kr](http://www.kiep.go.kr)

---

 **Korea Institute for International  
Economic Policy**

The Contents of the KIEP Visiting Fellow Program do not reflect or represent the official opinion of KIEP.

The KIEP Visiting Fellows Program is published with the aim of promoting discussions among researchers, and to remember the outstanding achievements by the visiting fellows who came to KIEP.

KOREA INSTITUTE FOR  
INTERNATIONAL ECONOMIC POLICY (KIEP)  
370 Sicheong-daero, Sejong-Si 30147, Korea  
Tel: (8244) 414-1042 Fax: (8244) 414-1144  
URL: <http://www.kiep.go.kr>

HYUN Jung Taik, *President*

---

Published 2016 in Korea by KIEP

© 2016 KIEP

# Acknowledgements

In 2009, Korea Institute for International Economic Policy (KIEP) launched “Visiting Fellows Program (VFP)” with the view of advancing cross-border exchanges of knowledge, information, insights and expertise.

Since its inception, the VFP has demonstrated that sharing thoughts and ideas through face-to-face contacts and dialogue works as a catalyst for enhancing mutual understanding among scholars and professionals with diverse background.

By successfully implementing the VFP for the past 8 years, KIEP has been motivated to assume the role as a hub for international economic research in the region. As a host of the program, KIEP has many mandates. One of those tasks is to let more people know what has been accomplished through the program and how valuable it is.

In an effort to do so, KIEP has published series of research every year. This volume, the 7th of its series, contains eight research papers contributed by 2015 Visiting Fellows.

Publication owes many debts. Here I acknowledge just a few of them. First of all, I must express my deepest gratitude to the 2015 visiting fellows for their outstanding performances. My special thanks also goes to Ms. RIM Jeewoon and the staffs of the KIEP Publishing Team who worked very hard for the publication of this volume.

The views expressed in this publication are the views of the author and do not necessarily reflect the views or policies of KIEP. KIEP does not guarantee the accuracy of the data included in the publication.

*HYUN Jung Taik*

President

Korea Institute for International Economic Policy

## Notes on the Contributors

**Dr. Cao Zhongxiang** is an associate professor, director of the Regional Strategy Division, Institute of Spatial Planning and Regional Economy, National Development and Reform Commission in Beijing, China. He received his Ph.D. in Human geography at the Institute of Geographic and Natural Resources, Chinese Academy of Sciences in Beijing, China. He was a visiting fellow in April, 2015.

**Dr. Sheng Chaoxun** is an associate research fellow at the Institute of Industrial and Technological Economics, National Development and Reform Commission, China. He received his Ph.D. in Industrial Economics at Renmin University in Beijing, China. He was a visiting fellow at KIEP in April, 2015.

**Dr. Kiril Tochkov** is an associate professor in the Department of Economics at Texas Christian University in Texas, U.S. He received his Ph.D. in Economics at the State University of New York at Binghamton, New York, U.S. He was a visiting fellow at KIEP from May 11th to June 12th in 2015.

**Dr. Zhou Mi** is a senior research fellow, deputy director of the Institute of World Economy, Chinese Academy of International Trade and Economic Cooperation in Beijing, China. He received his Ph.D. in Management Science and Engineering at Beihang University, Beijing, China. He was a visiting fellow at KIEP in June, 2015.

**Dr. Nashwa Mostafa Ali Mohamed** is an assistant professor in the Department of Economy and Foreign Trade at Helwan University, Egypt and an associate professor in the Department of Economics at King Saud University, Saudi

Arabia. She received her Ph.D. in Economics at Helwan University, Egypt. She was a visiting fellow at KIEP from June 28th to July 20th in 2015.

**Dr. Adolfo Alberto Laborde Carranco** is a research professor at Instituto Tecnológico y de Estudios Superiores de Monterrey in Mexico. He received his Ph.D. in International Cooperation at the University of Kobe in Japan. He was a visiting fellow at KIEP from June 28th to July 31st in 2015.

**Dr. Selçuk Çolakoğlu** is a professor of international relations at Yıldırım Beyazıt University and the Vice President of International Strategic Research Organization in Ankara, Turkey. He received his Ph.D. in International Relations at Ankara University in Turkey. He was a visiting fellow at KIEP in August, 2015.

**Dr. Xu Man** is an assistant researcher in the Department of American & Oceanian Studies, Institute of World Economy at the Chinese Academy of International Trade and Economic Cooperation. She was a visiting fellow at KIEP in September 2015.



# 3

## **Gravity, Borders, and the Potential for Economic Integration in the Asia Pacific: Evidence from Korea and Russia**

*Kiril Tochkov\**

### **Abstract**

Over the past decade, Russia has increasingly focused on promoting the economic development of its Far Eastern region by fostering cross-border cooperation with Northeast Asian countries. Korea has become one of the major trading partners of Russia's Far East (RFE). This paper examines the relations between Korea and Russia at both the national and regional levels using trade data in a gravity-model framework over the period 1992-2014. In particular, the study provides estimates

---

\* Associate Professor, Department of Economics, Texas Christian University, and Visiting Fellow, Korea Institute for International Economic Policy. The author would like to thank the Korea Institute for International Economic Policy for providing financial support and a conducive environment to carry out this study. The helpful comments and suggestions by Dr. Lee Jae Yong, Dr. Jeh Sung Hoon, and the staff at the Department of Europe, Americas, and Eurasia are gratefully acknowledged.

of the border effects between the two countries that allow the assessment of the extent of their economic integration. The results provide a mixed picture. The barriers to trade between Korea and Russia at the national level are significantly higher than between Korea and any other of its trading partners in the West or in East Asia. While these adverse border effects have declined in recent years, they remain high. At the regional level, Korea's border effects with RFE are on average not significantly different from those between Korea and the rest of Russia. However, while the former have gradually disappeared between 2010 and 2012, the former have remained largely constant. These findings suggest that RFE is increasingly integrated with Korea but numerous hurdles remain and prevent the full realization of the potential for regional development in Northeast Asia.

JEL Classification: F15, O53, R10

Keywords: Trade, Border effects, Regional integration, Korea, Russia, Northeast Asia

## I. Introduction

Over the past 25 years since Korea and Russia established diplomatic relations, both countries experienced a fundamental transformation of their economic and political systems. In the 1990s, expectations were high that democratic reforms, economic liberalization, and globalization would offer both countries a unique chance to foster a close relationship that would prove mutually beneficial. Although Korea has indeed developed into one of Russia's major trading partners, the potential for cross-border economic cooperation has not been fully realized. Recent developments seem to offer new hope that the two countries can deepen their economic ties. This study explores the trade barriers between Korea and Russia and analyzes the potential for closer economic cooperation between the two countries



in the context of regional integration in Northeast Asia (NEA).

The Russian economy has traditionally been oriented towards Europe, and the region west of the Urals has developed as the center of economic, and especially industrial, activity in the country. In contrast, Siberia and the Russian Far East (RFE) have remained sparsely populated, economically underdeveloped, internationally isolated, and focused on the extraction of natural resources. The past two decades have seen profound changes in the global economic and geopolitical structure that have had an impact on regional development and integration in Russia and NEA. The breakdown of the Soviet Union allowed Russia to restore and improve its relations with Japan, China, and Korea. After being sealed off from its NEA neighbors for almost eight decades, RFE was supposed to be one of the main beneficiaries of Russia's opening to the world. However, the difficult economic transition and political instability in Russia coupled with the East Asian Financial Crisis in 1997 and Russia's debt default a year later impeded the expansion of cross-border ties and stalled economic development in the RFE.

Over the past decade, Russia's economic boom driven by high commodity prices on world markets, China's emergence as a global economic superpower, and the deepening integration of Korea's dynamic and innovative economy within NEA have created new opportunities that resulted in a number of national, bilateral, and multilateral initiatives. At the multilateral level, the Greater Tumen Initiative (GTI) aims at promoting regional cooperation between China, Russia, Korea, and Mongolia mainly by facilitating trade, investment, and tourism, and expanding cross-border transportation infrastructure (Wang 2014).<sup>1)</sup> Moreover, the creation of a multilateral financial institution focused on supporting development projects in the NEA has been discussed since the 1990s. This idea was realized in part by the founding of the Asian Infrastructure Investment Bank (AIIB) in 2015, although the regional scope of AIIB is broader in that it covers the whole of Asia.

---

1) GTI was initiated in the 1990s under the auspices of the United Nations Development Program (UNDP) but in 2005 the member states took over the initiative, turning into a multilateral intergovernmental cooperation mechanism (Wang 2014).

The establishment of a free trade area between China and Korea in 2015 has been one of the major bilateral initiatives in NEA for the past decade. In addition, China and Russia have signed a number of agreements aimed at strengthening the economic ties between the two countries. The main goal of the 2009 “Program for Cooperation between the Regions of Siberia and RFE and China’s Northeast” is to deepen long-term regional cooperation by expanding cross-border trade, infrastructure and investment (Izotov 2014). Also in 2009, Russia agreed to deliver Siberian oil to China for 20 years using a spur pipeline of the Eastern Siberia-Pacific Ocean Pipeline. Similarly, in 2014, China and Russia negotiated a deal to deliver gas from RFE to China over a 30-year period along the planned “Power of Siberia” pipeline.

Countries in the region have also been active in promoting national-level initiatives with a focus on economic cooperation in the NEA. The Eurasia Initiative announced by Korea’s President Park in 2013 targets the expansion of trade, energy, and transportation links between Korea and Russia as well as the promotion of knowledge-based economic development in the region (Lee 2015; Jeh 2015). The initiative places a particular emphasis on establishing logistics networks that would connect Korea to Russia’s railway and energy networks, which in turn requires the active engagement of North Korea in the process (Lee 2015; Jeh 2015). Russia’s national level strategy with respect to NEA has focused on the economic development of RFE as the key link to regional integration in the Asia-Pacific region (Lee *et al.*, 2010). Some of the main components of this strategy include the adoption of the “Socio-Economic Development of the Far East and the Baikal region” program, the creation of a federal-level Ministry for the Development of the Far East in 2012, and plans to create zones of advanced socio-economic development in order to attract foreign investment from NEA (Jeh and Kang 2013; Jeh *et al.* 2014).

These initiatives have had some positive effects. According to Russian customs data, Korea in 2005 was the third largest importer of goods from RFE and the third largest exporter to RFE after China and Japan. Only seven years later, Korea was already the second largest importer from RFE and was exporting twice as much to RFE than Japan, ranking second behind only China. At the same time, the poor

infrastructure, red tape, institutional and legal barriers, haphazard applications of the rule of law, ineffective coordination between federal and local authorities, and high production costs have created obstacles to trade and investment in the region.

The goal of this paper is to examine the relationship and the extent of integration between Korea and Russia at the national as well as at the regional level over the period 1992-2014. For this purpose, trade data is used to estimate a gravity-type model that produces estimates of the border effects between the two countries. These effects measure the cost of moving goods across the border by controlling for the impact of geographical distance and the size of the trading partner's economies and are calculated for the trade between Russia and Korea as well as between RFE and Korea. The objective is to explore whether the barriers to trade as represented by the border effects have increased or declined over time, which in turn can show whether the economic integration of the two countries or regions has deepened.

The issues explored in this study have important policy implications. The weak demand on Western markets for Russia's natural resources in the aftermath of the global economic crisis and the deterioration of political and economic relations with the West as a result of the Ukrainian crisis have compelled Russia to accelerate its economic cooperation with NEA and to speed up the development of RFE. At the same time, Korea is increasingly seeking access to the energy resources and transportation networks in RFE which would not only help expand its foreign trade and investment but would also contribute to its engagement with North Korea. The findings of this study would make it possible to assess the success of both countries' initiatives. This, in turn, will assist policy makers with the decision of whether to revise or expand their current strategies.

The rest of the paper is organized as follows. The next section describes the gravity model that is used to estimate the border effects, while Section 3 discusses briefly the data used. Section 4 presents and interprets the results of the empirical analysis. Section 5 discusses the potential determinants of the border effects between Russia and Korea. The concluding remarks are in Section 6.

## II. Methodology

### 2.1. Theoretical model

The theoretical foundation of the gravity model of trade was first set by Anderson (1979) and later augmented by Anderson and van Wincoop (2003). They assume that each country is specialized in the production of a single good and that consumer preferences are identical, homothetic, and approximated by a constant elasticity of substitution (CES) utility function. The representative consumer of a given country  $j$  maximizes the following utility function:

$$U_j = \left[ \sum_{i=1}^N \left( \frac{c_{ij}}{\gamma_i} \right)^{\frac{\sigma-1}{\sigma}} \right]^{\frac{\sigma}{\sigma-1}} \quad (1)$$

subject to the budget constraint

$$y_j = \sum_{i=1}^N x_{ij} = \sum_{i=1}^N p_{ij} c_{ij} \quad (2)$$

where  $c_{ij}$  stands for country  $j$ 's consumption of the imports from country  $i$  ( $i=1, \dots, N$ ),  $\gamma_i$  is a positive distribution parameter representing the share of country  $j$ 's exports in country  $i$ 's consumption, and  $\sigma$  is the elasticity of substitution. Furthermore,  $y_j$  is the total nominal income of country  $j$ ,  $x_{ij}$  denotes the nominal value of exports from  $i$  to  $j$ , and  $p_{ij}$  is the price of country  $i$ 's exports faced by country  $j$ 's consumers. It is assumed that  $p_{ij}$  includes transportation costs (i.e., cost including freight), while the supply price in country  $i$ ,  $p_i$ , is net of these costs (i.e., free on board). The relationship between the two is expressed as  $p_{ij} = p_i t_{ij}$ , where  $t_{ij}$  stands for the trade costs between  $i$  and  $j$ .

The representative consumer's optimization yields

$$x_{ij} = y_j \left( \frac{\gamma_i p_i t_{ij}}{P_j} \right)^{1-\sigma} \quad (3)$$

where country  $j$ 's consumer price index,  $P_j$ , is given by

$$P_j = \left[ \sum_{i=1}^N (\gamma_i P_i t_{ij})^{1-\sigma} \right]^{\frac{1}{1-\sigma}} \quad (4)$$

The assumption of market clearance implies that  $y_i = \sum_{j=1}^M x_{ij}$ , which can be used to solve for the scaled prices  $\{\gamma_i P_i\}$  and then substitute them into equation (3). If trade costs are assumed to be symmetrical ( $t_{ij} = t_{ji}$ ), this yields

$$x_{ij} = \frac{y_i y_j}{y^w} \left( \frac{t_{ij}}{P_i P_j} \right)^{1-\sigma} \quad (5)$$

where  $P_i$  is country  $i$ 's consumer price index and  $y^w = \sum_{j=1}^M y_j$  is the world nominal income. The gravity model in equation (5) indicates that bilateral trade depends on the world income shares of the two economies, the trade costs, and the price index of each country. Anderson and van Wincoop (2003) refer to  $P_i$  and  $P_j$  as multilateral trade resistance terms because each is a function of all bilateral trade costs and not only those between  $i$  and  $j$ . In other words, bilateral trade is determined by the trade barriers between both countries relative to the average trade barriers that each of them faces with all their trading partners.

## 2.2. Empirical model

To estimate the gravity model empirically, equation (5) is linearized and becomes

$$\ln x_{ij} = \ln(y_i y_j) - \ln y^w + (1 + \sigma) \ln t_{ij} - (1 - \sigma) \ln P_i - (1 - \sigma) \ln P_j \quad (6)$$

Some studies interpret  $P_i$  and  $P_j$  literally as aggregate price levels and use the corresponding statistical indicators in their estimation (Baier and Bergstrand 2001). However, as multilateral resistance terms, the two variables are not observed in practice because they have a much broader definition of trade costs than price indexes. Anderson and van Wincoop (2003) solve for  $P_i$  and  $P_j$  after obtaining

the bilateral trade cost variable,  $t_{ij}$ , but this strategy requires a custom-programmed simultaneous estimation of a large system of equations. As an alternative, Feenstra (2002) suggests using exporter (country  $i$ ) and importer (country  $j$ ) fixed effects to account for the two unobserved multilateral resistance terms, which also produces a consistent estimate of the average border effect with a very similar magnitude.

The main variable of interest in the gravity model is the bilateral trade cost factor, which is not observed in practice but can be approximated in line with Anderson and van Wincoop (2003) as follows

$$t_{ij} = b_{ij}d_{ij}^{\rho}e^{\tau_{ij}} \quad (7)$$

where  $b_{ij}$  represents the border effect and  $d_{ij}$  the distance between countries  $i$  and  $j$ , while  $\tau_{ij}$  includes all remaining factors that could affect bilateral trade costs, such as contiguous borders, common language, colonial ties, free trade agreements, etc. The border effect is defined as  $b_{ij} = b^{1-\delta_{ij}}$ , where  $\delta_{ij}$  is a dummy variable that takes the value of one for intranational trade (i.e.,  $i$  and  $j$  are regions of the same country) and zero for cross-border trade (i.e.,  $i$  and  $j$  are in different countries).

Inserting equation (7) into (6) yields

$$\begin{aligned} \ln x_i = & \ln(y_i y_j) - \ln y^w + (1-\sigma)\ln b(1-\delta_{ij}) + (1-\sigma)\rho \ln d_{ij} \\ & + (1-\sigma)\tau_{ij} - (1-\sigma)\ln P_i - (1-\sigma)\ln P_j \end{aligned} \quad (8)$$

The stochastic form of the gravity model in equation (8) is then given by

$$\ln\left(\frac{x_{ij}}{y_i y_j}\right) = \alpha_i \lambda_i + \alpha_j \lambda_j + \beta_1 \ln d_{ij} + \beta_2 \tau_{ij} + \beta_3 (1-\delta_{ij}) + \epsilon_{ij} \quad (9)$$

where following Feenstra's (2002) approach,  $\lambda_i$  and  $\lambda_j$  denote the exporter and importer fixed effects, respectively, with  $\alpha_i = \ln(P_i)^{\sigma-1}$  and  $\alpha_j = \ln(P_j)^{\sigma-1}$ . In particular,  $\lambda_i(\lambda_j)$  is a dummy variable that takes the value of one if country  $i$  (country  $j$ ) is the exporter (importer), and zero otherwise.<sup>2)</sup> Furthermore,  $\beta_1 = (1-\sigma)\rho$ ,  $\beta_2 = (1-\sigma)$ , and  $\beta_3 = (1-\sigma)\ln b$ . In line with Anderson and van Wincoop (2003), the dependent variable is defined as the natural logarithm of size-adjusted

2) The world nominal income is no longer included in equation (9) because it has been absorbed by the fixed effects as it does not fluctuate across countries.

trade, which carries several advantages. Bilateral trade adjusted for the size of the economies eliminates the need for converting nominal trade flows into real values, which can be problematic (Baldwin and Taglione 2006). In addition, it resolves the issue of the endogeneity of aggregate income and helps to deal with heteroscedasticity (Olivero and Yotov 2012).

The gravity model in equation (9) is adapted in the context of the current paper as follows

$$\ln\left(\frac{x_{ijt}}{y_{it}y_{jt}}\right) = \alpha_i\lambda_i + \alpha_j\lambda_j + \eta_t + \beta_1\ln d_{ij} + \beta_2\text{CONT}_{ij} + \beta_3\text{FAT} \\ + \beta_4(\text{KOR}\times\text{RU}) + \beta_6(\text{RU}\times\text{ROW}) + \beta_7(\text{ROW}\times\text{ROW}) + \epsilon_{ijt} \quad (10)$$

The panel structure of the data is exploited by allowing exports and aggregate income to vary across time as well. In addition, time fixed effects ( $\eta_t$ ) are included in the equation to control for any factors that fluctuate across time but not across countries. The trade barrier indicator,  $\tau_{ij}$ , is now broken down into two components. Contiguous borders (CONT) is a dummy variable that takes the value of one if countries  $i$  and  $j$  share a border, and zero otherwise. Free trade agreement (FTA) is a dummy variable that takes the value of one for country pairs that have implemented an FTA in bilateral trade, and zero otherwise.

Most importantly, the model in equation (10) includes four border effects. The dummy variables  $\text{KOR}\times\text{RU}$  and  $\text{KOR}\times\text{ROW}$  take the value of one when Korea trades with the Russia and the rest of the world, respectively, and zero otherwise. The remaining two dummy variables,  $\text{RU}\times\text{ROW}$  and  $\text{ROW}\times\text{ROW}$ , capture the effects of the borders on trade between Russia and the rest of the world and within the rest of the world, respectively. The control group for all border effects is the trade between Korea and the rest of the world.

As mentioned above, the estimates of the coefficients  $\beta_4$  through  $\beta_7$  are each equal to  $\hat{\beta} = (1 - \sigma)\ln b$ , whereby the ad-valorem tariff equivalent of the border barrier is defined as  $b - 1$ . Dividing both sides of the equation by  $(1 - \sigma)$  and taking

the exponent yields  $b = \exp\left[\frac{\hat{\beta}}{1-\sigma}\right]$ . Accordingly, the border effect is obtained by  $\exp\left[\frac{\hat{\beta}}{1-\sigma}\right] - 1$ . In line with previous studies (Head and Ries 2001, Anderson and van Wincoop 2003), the elasticity of substitution,  $\sigma$ , is assumed to range between 5 and 10 and the tariff equivalent of the border is calculated for three  $\sigma$  values (5, 7, and 10).

### III. Data

The data on bilateral trade over the period 1992-2014 is obtained from the International Monetary Fund's Direction of Trade Statistics (DOTS) database. Korea's trading partners included in the analysis are the European Union (EU) and the Association of South East Asian Nations (ASEAN) (each of which is treated as a single entity), the United States, Russia, China (which includes Hong Kong), Japan, and Taiwan. In some specifications of the model, all countries except for Russia and Korea are lumped together as rest of the world (ROW), while in others they are divided into Western countries (EU and US), East Asia (China, Japan and Taiwan) and ASEAN. In the latter case, Korea's trade with the West is used as a benchmark for evaluating the border effects between Korea and Russia.

The regional data for Russia includes the trade of RFE with China, Japan, and Korea and was collected from the Customs Office of the Russian Federation. Due to data availability, the sample period is limited to the years 2005-2012. The data for trade between RFE and the rest of Russia was obtained from the Federal State Statistics Service of Russia. It is worth mentioning that the RFE is not treated as a single entity but rather the trade flows of each of the 9 RFE regions is included separately. In the regional analysis, the benchmark for the border effect between Korea and Russia is the trade between RFE and the rest of Russia.



Geographical distance is measured as the great-circle distance in kilometers between the capital cities or administrative centers of the trading partners. Data on gross domestic product (GDP) by country measured in current US dollars was obtained from the World Bank's World Development Indicators database. The GDP of Russian regions in rubles was collected from the Federal State Statistics Service of Russia and converted into US dollars using the average annual exchange rate reported by the Central Bank of Russia.

## IV. Results

### 4.1. National level

This section begins with the analysis of trade flows between Korea and some of its major trading partners over the period 1992-2014. The exports shown in Table 1 indicate that in the early 1990s, Japan, the US, and the EU were the main destinations for Korean goods and accounted for more than half of the total exports. While the dollar value of exports increased in the following two decades, the percentage share of these three trading partners decreased by half. At the same time, China (which also includes Hong Kong) has been absorbing an increasingly

**Table 1. Korean exports to its major trading partners, 1992-2014**

(Unit: billion USD)

	Russia		China		Japan		Taiwan		ASEAN		EU		USA	
	USD	%	USD	%	USD	%	USD	%	USD	%	USD	%	USD	%
1992	0.1	0.2	8.6	11.1	11.6	15.0	2.3	2.9	9.0	11.7	10.3	13.3	18.2	23.5
1993	0.6	0.7	11.6	13.5	11.5	13.5	2.3	2.7	10.1	11.7	10.8	12.5	18.2	21.2
1994	0.9	1.0	14.2	14.0	13.5	13.3	2.7	2.7	12.4	12.2	12.2	12.1	20.7	20.4
1995	1.4	1.1	19.8	15.1	17.0	13.0	3.9	3.0	17.9	13.6	17.9	13.6	24.3	18.5

1996	1.9	1.4	22.5	16.3	15.8	11.5	4.0	2.9	20.1	14.6	17.6	12.8	21.9	15.9
1997	1.7	1.2	25.3	17.6	14.8	10.3	4.6	3.2	20.1	14.0	19.3	13.4	21.8	15.2
1998	1.1	0.8	21.3	16.0	12.3	9.2	5.2	3.9	15.1	11.4	20.9	15.7	23.1	17.4
1999	0.6	0.4	22.7	15.8	15.9	11.0	6.4	4.4	17.4	12.1	22.2	15.4	29.6	20.6
2000	0.7	0.5	29.2	16.9	20.5	11.9	8.0	4.7	19.7	11.5	24.9	14.5	37.8	21.9
2001	0.9	0.6	27.6	18.4	16.5	11.0	5.8	3.9	16.1	10.7	21.3	14.2	31.4	20.8
2002	1.1	0.7	33.9	20.9	15.1	9.3	6.6	4.1	18.1	11.2	24.0	14.8	32.9	20.3
2003	1.7	0.9	49.8	25.7	17.3	8.9	7.0	3.6	19.9	10.3	27.3	14.1	34.4	17.7
2004	2.3	0.9	67.9	26.8	21.7	8.6	9.8	3.9	23.7	9.3	38.5	15.2	43.0	17.0
2005	3.9	1.4	77.4	27.2	24.0	8.5	10.9	3.8	27.1	9.5	44.4	15.6	41.5	14.6
2006	5.2	1.6	88.4	27.2	26.5	8.2	13.0	4.0	31.7	9.7	49.4	15.2	43.3	13.3
2007	8.1	2.2	100.6	27.1	26.4	7.1	13.0	3.5	38.1	10.3	56.3	15.1	45.9	12.4
2008	9.8	2.3	111.2	26.3	28.3	6.7	11.5	2.7	48.6	11.5	58.7	13.9	46.5	11.0
2009	4.2	1.2	106.4	29.3	21.8	6.0	9.5	2.6	40.2	11.1	46.7	12.9	37.8	10.4
2010	7.8	1.7	142.1	30.5	28.2	6.0	14.8	3.2	52.2	11.2	53.7	11.5	50.0	10.7
2011	10.3	1.9	165.2	29.7	39.7	7.2	18.2	3.3	70.1	12.6	56.4	10.2	56.4	10.2
2012	11.1	2.0	166.9	30.5	38.8	7.1	14.8	2.7	76.9	14.0	49.7	9.1	58.8	10.7
2013	11.2	2.0	173.6	31.0	34.7	6.3	15.7	2.8	80.4	14.4	49.1	8.7	62.3	11.1
2014	10.1	1.8	172.5	30.1	32.2	5.6	15.1	2.6	82.7	14.4	52.2	9.1	70.6	12.3

Note: Exports are reported in billions USD and as a percentage share of Korea's total world exports.

Source: DOTS.

larger share of Korean export that reached 30% in 2014, exceeding the combined contribution of Japan, the US, and the EU. While exports to Taiwan and ASEAN intensified in dollar terms, their shares remained relatively stable. Compared to other trading partners, Russia showed relatively modest levels of Korean imports. Only since 2005 exports began to climb and their dollar value more than doubled over a period of five years. However, the share of Korean exports to Russia in total exports never exceeded 2%.

On the one hand, these numbers are not surprising given that Russia and Korea established diplomatic relations only in 1991. In addition, Russia experienced a difficult period of economic transition and financial crises over the 1990s. On the other hand, the share of Korean exports destined for Russia is disappointing when the geographic proximity and the complementarity of the two economies are taken into account.

Table 2 presents a similar picture for Korean imports. Although Russia exports more to Korea than it imports, the amounts involved are relatively small and are dwarfed by the trade between China and Korea. Moreover, the importance of Japan, the US, and the EU as suppliers to the Korean market has declined dramatically over the past two decades, which again parallels the rise of China as one of the key trading partners.

Although the data in Tables 1 and 2 already indicate that Korea's trade with Russia is much smaller in scale than with other countries, it is necessary to control for the effects of size and geographical distance before any conclusions can be made. For this purpose, the gravity model is estimated and the results are shown in Table 3. The baseline specification includes Russia, Korea, and its six other trading partners in the sample. The border effects are estimated via four variables that account for the trade between Korea and Russia, between Korea and the six countries, between Russia and the six countries and among the six countries themselves. The trade between Korea and the six countries is chosen as the benchmark and its variable is dropped from the equation as it is represented by the constant.

Table 2. Korean imports from its major trading partners, 1992–2014

(Unit: billion USD)

	Russia		China		Japan		Taiwan		ASEAN		EU		USA	
	USD	%	USD	%	USD	%	USD	%	USD	%	USD	%	USD	%
1992	0.1	0.1	4.5	5.4	19.5	23.5	1.3	1.6	6.8	8.2	10.6	12.8	18.3	22.1
1993	1.0	1.1	4.9	5.6	20.0	23.1	1.4	1.6	7.0	8.1	11.3	13.0	18.0	20.7
1994	1.2	1.2	6.1	6.0	25.4	24.8	1.8	1.8	7.5	7.4	14.8	14.5	21.6	21.1
1995	1.9	1.4	8.2	6.1	32.6	24.1	2.6	1.9	9.7	7.2	18.6	13.7	30.4	22.5
1996	1.8	1.2	9.7	6.4	31.4	20.9	2.7	1.8	11.6	7.7	21.6	14.4	33.3	22.2
1997	1.5	1.0	10.8	7.5	27.8	19.2	2.4	1.7	12.0	8.3	19.3	13.3	30.0	20.7
1998	1.0	1.1	7.0	7.5	16.8	18.0	1.7	1.8	8.8	9.4	11.2	12.0	20.4	21.9
1999	1.6	1.3	9.8	8.1	24.1	20.2	3.0	2.5	11.9	10.0	12.9	10.8	24.9	20.8
2000	2.1	1.3	14.1	8.8	31.8	19.8	4.7	2.9	17.7	11.0	16.2	10.1	29.3	18.2
2001	1.9	1.4	14.5	10.3	26.6	18.9	4.3	3.0	15.4	10.9	15.3	10.9	22.4	15.9
2002	2.2	1.5	19.1	12.6	29.9	19.6	4.8	3.2	16.2	10.7	17.6	11.6	23.1	15.2
2003	2.5	1.4	24.6	13.8	36.3	20.3	5.9	3.3	17.9	10.0	19.9	11.1	24.9	13.9
2004	3.7	1.6	32.9	14.6	46.1	20.6	7.3	3.3	21.7	9.6	24.4	10.9	28.9	12.9
2005	3.9	1.5	40.7	15.6	48.4	18.5	8.0	3.1	25.2	9.7	27.4	10.5	30.8	11.8
2006	4.6	1.5	50.7	16.4	51.9	16.8	9.3	3.0	28.4	9.2	30.2	9.8	33.8	10.9
2007	7.0	2.0	65.2	18.3	56.3	15.8	10.0	2.8	32.0	9.0	36.9	10.3	37.4	10.5
2008	8.3	1.9	79.2	18.2	61.0	14.0	10.6	2.4	39.0	9.0	40.0	9.2	38.6	8.9
2009	5.8	1.8	55.7	17.3	49.4	15.3	9.9	3.0	33.0	10.2	32.3	10.0	29.2	9.0
2010	9.9	2.3	73.5	17.3	64.3	15.1	13.6	3.2	42.4	10.0	38.7	9.1	40.6	9.5
2011	10.9	2.1	88.7	16.9	68.3	13.0	14.7	2.8	50.7	9.7	47.4	9.0	44.8	8.5
2012	11.4	2.2	82.8	15.9	64.4	12.4	14.0	2.7	49.5	9.5	50.4	9.7	43.7	8.4
2013	11.5	2.2	85.0	16.5	60.0	11.6	14.6	2.8	50.8	9.8	56.2	10.9	41.8	8.1
2014	15.7	3.0	91.8	17.5	53.8	10.2	15.7	3.0	51.3	9.8	62.4	11.9	45.5	8.7

Note: Imports are reported in billions USD and as a percentage share of Korea's total world exports.

Source: DOTS.

The estimates in the first column of Table 3 show that the coefficients of the control variable have the expected signs. Distance has an adverse effect, while contiguity and FTAs promote trade. The coefficient for FTA is not statistically significant, which is mainly due to the fact that the number of FTAs, especially in East Asia, has only increased in recent years. The variable of interest is the dummy representing trade between Russia and Korea.<sup>3)</sup> The negative sign of the coefficient indicates that the value of size-adjusted trade between Russia and Korea is lower than the trade between Korea and its six main trading partners. For a better interpretation of the magnitude, the coefficient is converted into the tariff equivalent of the border effect using three different values for the elasticity of substitution. The resulting numbers are shown in bold and suggest that the border between Russia and Korea adds a tariff equivalent of 41.4% (assuming  $\sigma=7$ ) above the one that exists between Korea and its six main trading partners. Depending on the elasticity of substitution, this number can vary between 26% and 68%. This border effect is statistically significant and confirms the idea that even after controlling for distance and contiguity the trade between Russia and Korea is not optimal.

**Table 3. Baseline regression estimates and border effects**

	(1)			(2)			(3)		
<i>KOR</i> × <i>RU</i>	-2.08***	$\sigma=5$	68.2	-2.89*** (0.12)	$\sigma=5$	105.96	93-98	-3.14***	68.76
		$\sigma=7$	41.4		$\sigma=7$	61.88	99-08	-2.80***	59.47
	(0.16)	$\sigma=10$	25.9		$\sigma=10$	37.87	08-14	-1.96***	38.63
<i>KOR</i> × <i>EA</i>	-	-	-	-1.78*** (0.20)	$\sigma=5$	56.05	93-98	-1.89***	37.03
					$\sigma=7$	34.54	99-08	-0.68	12.00
					$\sigma=10$	21.87	08-14	-1.58***	30.13

3) The coefficients for the variables representing trade between Russia and the other countries as well as trade among the other countries themselves are not reported, as their interpretation is not relevant in the context of the paper. The results are available from the author upon request.

<i>KOR</i> × <i>ASEAN</i>	-	-	-	-0.57*** (0.11)	$\sigma=5$ 15.32 $\sigma=7$ 9.97 $\sigma=10$ 6.54	93-98 -0.67*** 11.81 99-08 -0.54* 9.42 08-14 -0.31 5.30
$\ln(\text{Distance})$	-1.60*** (0.04)	-	-	-1.08*** (0.10)	-	-
<i>Contiguity</i>	0.43*** (0.07)	-	-	1.30*** (0.06)	-	-
<i>FAT</i>	0.08 (0.06)	-	-	-0.12 (0.08)	-	-
<i>Contant</i>	1.34*** (0.34)	-	-	-2.69*** (0.96)	-	-
Time FE	Yes	-	-	Yes	-	-
Exp./Imp. FE	Yes	-	-	Yes	-	-
Obs.	1334	-	-	1334	-	-
R <sup>2</sup>	0.93	-	-	0.92	-	-

Note: \*\*\*  $p < 0.01$ ; \*\*  $p < 0.05$ ; \*  $p < 0.10$ . The estimated coefficients for the border effects between countries or group of countries not involving Korea and Russia are not reported in the table but are available upon request. The estimates in the third column assume an elasticity of substitution of  $\sigma=7$ . Robust standard errors are in parenthesis.

Source: Author's calculations.

Fig. 1 illustrates the tariff equivalent of the border effects for individual years. It is evident that over the early 1990s the border effect was decreasing and reached a low of 28% in 1998. However, over the following decade it increased steadily to an all-time high of 50% in 2008. Over the past few years, the border effect has again returned to the same level as in 1993. Interestingly, Russia's entry into the WTO in 2012 does not seem to have had any immediate impact on its border effects with Korea in relative terms.

Figure 1. The border effect on trade between Korea and Russia(Tariff equivalent)

(Unit: %)



Note: Calculations conducted assuming an elasticity of substitution  $\sigma=7$ .

Source: Author's calculations

The increase in the border effect between 1998 and 2008 is most likely caused by changes in the shares of trade. As can be seen from Tables 1 and 2, this is the period when both Russian exports to and imports from Korea grew almost tenfold but from a relatively low base of \$1 billion in 1998. However, this was not sufficient to compensate for the rise in trade between Korea and its other trading partners. Specifically, China's trade with Korea also expanded by a factor of six for exports and 10 for imports but the starting point in 1998 was more than 20 times larger than Russia's in the case of exports and 7 times larger for imports.

The reason for the decline in the border effect after 2008 seems to be the global financial crisis and the economic downturn that followed, which slowed down the relative expansion of trade between Korea and its main trading partners. To examine the factors behind the changes in the border effects over the sample period in greater depth, the regression model is modified by decomposing Korea's six trading partners into three groups: East Asia (China, Japan, and Taiwan), the West (US and EU), and ASEAN and estimating separate border effects. The results

reported in the second column of Table 3 confirm the previous findings of a negative and significant border effect between Russia and Korea. The magnitude of the coefficient is slightly higher than in the first column and produces a tariff equivalent of the border of 62%.<sup>4)</sup>

The decomposition of the trading partners reveals that the border between Korea and its East Asian neighbors also serves as a trade barrier that imposes a tariff equivalent of 35% above the one that exists in Korea's trade with the West. Although the ASEAN countries also have a significant border effect with Korea, its magnitude relative to the benchmark is only around 10%. Accordingly, the EU and the US, which serve as the benchmark in this specification, have the lowest border effects with Korea among all countries included in the model. In other words, after taking into account the effects of distance and contiguity, Korea appears to be better integrated with the West than with East and Southeast Asia. In that context, Russia is ranked last with border effects that are twice as large as those for East Asia and six times larger than for the ASEAN.

The third column of Table 3 displays the coefficients and border effects for the same constellation of countries for three different periods (1993-1998, 1999-2008, and 2009-2014). The picture that emerges confirms broadly the factors behind the changing trends in Fig. 1 but also provides more detailed insights. Relative to the trade barriers between Korea and the West, the border effect between Korea and Russia decreases in successive periods but remains significant. However, the decline between the period before and after 2008 is far greater than between the years before and after 1998, which is in line with the decreasing border effects with the rest of the world after 2008 in Fig. 1.

East Asian countries exhibit a very different pattern. The tariff equivalent of the border effect is just 37% before 1998 and drops to 12% over the following decade, which is statistically not significantly different from the trade barriers between

---

4) For simplicity, the rest of the paper will focus on the border effects estimated with an elasticity substitution of  $\sigma = 7$



Korea and the West. Accordingly, thanks to the rapid economic growth in China during this period, East Asian countries managed to strengthen their integration with Korea to levels previously reserved for the EU and the US. This relative improvement for East Asia over the 2000s is the reason behind the growing border effect between Korea and Russia relative to the rest of the world illustrated in Fig. 1. In the aftermath of the global financial crisis, the border effects between Korea and East Asia increase and become significant again, which, in turn, helps Russia to experience a relative decline in its trade hurdles with Korea after 2008. The ASEAN are found to have the most consistent integration process with Korea as their border effects decrease in magnitude and eventually even lose statistical significance relative to the West.

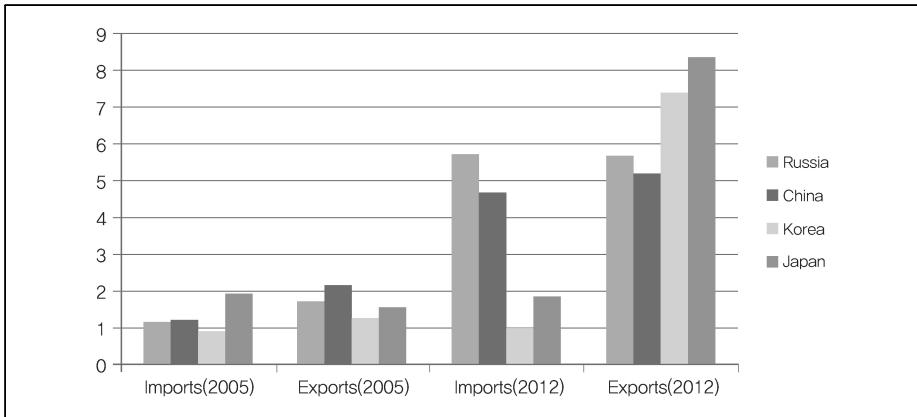
#### 4.2. Regional level

In the previous section, the border effects between Korea and Russia were estimated at the national level. Given the size of Russia, spatial differences in economic activity across regions mean that national averages could provide a misleading picture of the trade barriers between Korea and various Russian regions. In particular, the regions of the Russian Far East (RFE) are geographically significantly closer to Korea than the Western part of the country and are therefore likely to have more intensive economic ties with Northeast Asia. Moreover, the Russian government has chosen RFE as the key link in Russia's integration into the Asia-Pacific regions. The Korean government and businesses are also interested in the economic cooperation with RFE.

To explore the extent of trade links between Korea and RFE, the gravity analysis is now applied to Russian regional data. Specifically, a four-country model is assumed whereby RFE is treated as a separate entity that trades with the rest of Russia, Korea, and Northeast Asia (China and Japan). The descriptive statistics of the trade flows between these four entities are illustrated for two years in Fig. 2.

Figure 2. Exports and imports of the Russian Far East, 2005 and 2012

(Unit: billions USD)



Source: Authors calculations based on data from the Federal State Statistical Service of Russia.

It is evident that between 2005 and 2012, RFE's trade with both Russia and Northeast Asia intensified. RFE's trade with the rest of Russia more than tripled, whereby RFE ran a small trade surplus. Exports to Northeast Asian countries quadrupled, while imports doubled. RFE's trade surplus with Northeast Asia increased by \$11 billion. In 2005, Korea was the third largest trade partner of RFE in Northeast Asia behind China and Japan. Seven years later, Korea had become the second largest importer of RFE goods after Japan but China's exports to RFE dwarfed both Japan's and Korea's combined.

Table 4. Regression estimates and border effects for the Russian Far East, 2005–2012

	(1)			(2)			(3)		
<i>KOR</i> × <i>RFE</i>	-1.05*** (0.22)	$\sigma=5$ 30.0 $\sigma=7$ 19.1 $\sigma=10$ 12.4		-0.38 (0.44)	$\sigma=5$ 9.97 $\sigma=7$ 6.54 $\sigma=10$ 4.31		05-08 -1.04*** 09-12 -0.09	18.93 1.51	
<i>KOR</i> × <i>RU</i>	-1.62*** (0.46)	$\sigma=5$ 49.9 $\sigma=7$ 31.0 $\sigma=10$ 19.7		-	-	-	05-08 -2.00*** 09-12 -2.08***	39.56 41.44	
<i>RU</i> × <i>RFE</i>	-	-	-	0.77** (0.36)	$\sigma=5$ -17.51 $\sigma=7$ -12.04 $\sigma=10$ -8.20		-	-	
$\ln(\textit{Distance})$	0.10 (0.24)	-	-	-0.01 (0.22)	-	-	-	-	
<i>Contiguity</i>	1.68*** (0.21)	-	-	1.75*** (0.19)	-	-	-	-	
<i>Contant</i>	-30.82*** (1.78)	-	-	-32.20*** (1.90)	-	-	-	-	
Time FE	Yes	-	-	Yes	-	-	-	-	
Exp./Imp. FE	Yes	-	-	Yes	-	-	-	-	
Obs.	650	-	-	650	-	-	-	-	
R <sup>2</sup>	0.55	-	-	0.53	-	-	-	-	

Note: \*\*\*  $p < .01$ ; \*\*  $p < 0.05$ ; \*  $p < .10$ . The estimated coefficients for the border effects between countries or regions not involving Korea and RFE are not reported in the table but are available upon request. The estimates in the third column assume an elasticity of substitution of  $\sigma=7$ . Robust standard errors are in parenthesis.

Source: Author's calculations.

More importantly, Northeast Asia's trade with RFE was far greater than the trade between RFE and the rest of Russia over the entire period 2005–2012. This suggests that RFE might be better integrated within Northeast Asia than within the national borders of Russia. However, this could simply be the result of geographical proximity which conceals the true nature of the economic links between RFE and its Northeast Asian neighbors.

The results of the gravity model estimation are presented in Table 4. For the specification in the first column, the trade barriers between Russia and RFE serve as benchmark. The estimates show that after controlling for distance and contiguity the border between Korea and RFE has a negative and significant effect on trade relative to the benchmark. But the magnitude of the coefficient is relatively low and translates into a relative tariff equivalent of 19%. In contrast, the border between Korea and the rest of Russia exhibits a tariff equivalent of 31%. This means that RFE is better integrated within Russia than with Korea but the trade barriers between RFE and Korea do not seem particularly high in comparison.

The additional cost of crossing the border between Korea and the rest of Russia is higher relative to the trade of RFE with both Korea and other Russian regions. In the second column of Table 4, the estimation uses the trade between Korea and the rest of Russia as benchmark and the results indicate that the difference in the border effects between Korea and either RFE or the rest of Russia is not statistically significant. In other words, this means that once we control for geographical proximity, Korea does not have closer trade relations with RFE relative to the rest of Russia. This would seem to question the role of RFE as a potential hub of economic cooperation between Russia and Northeast Asia.

To test the robustness of these findings, the change in the border effects over time is explored in more detail. The third column of Table 4 reports the results for two subperiods using again trade within Russia as the benchmark. For the period 2005-08, the border effect between Korea and the rest of Russia is around twice as large as the one between Russia and RFE. This time the difference is statistically significant and indicates that indeed RFE, in comparison to Russia, has lower barriers to trade with Korea. In the period 2009-2012, the border effect between Korea and RFE disappears, while the one between the rest of Russia and Korea remains almost constant. This is a surprising result for two reasons. First, it suggests that after 2009 RFE and Korea have become as integrated as RFE and the rest of Russia, keeping the geographical distance and contiguity constant. Second, it shows that there is a significant decline in RFE's border effects with

Korea over time in relative terms. Accordingly, it seems that RFE is indeed turning gradually into a key link in the economic cooperation between Russia and Korea.

## V. Potential Determinants of the Border Effects

The main results of the analysis indicate that the border between Korea and Russia represents a much bigger obstacle to trade than the borders with its Northeast Asian neighbors and Western countries. There is some hope that these obstacles to trade are on the decline, especially in RFE. Nevertheless, the findings make it obvious that there is a lot of room for improvement.

One of the main barriers to trade are tariffs and duties imposed on imported goods. Russia joined the WTO in 2012 and its average tariffs have decreased accordingly. Russia has also formed a customs union with Kazakhstan and Belarus which was absorbed into the Eurasian Economic Union in 2015. But most of Russia's trade agreements are with former Soviet countries that are much smaller in size and do not offer significant economic benefits to Russia. Korea on the other hand has implemented a large number of FTAs with the largest Western countries such as EU and the US but also with regional blocs such as the ASEAN and other countries in the Asia Pacific such as Singapore and Chile. It is therefore not surprising to see that border effects between Korea and the West are lower than between Korea and Russia.

In the case of Korean trade with RFE and the rest of Russia, however, tariffs cannot explain the border effects because tariffs are implemented at the national level and thus do not provide RFE with an advantage over the rest of Russia. Arguably, the larger part of the border effects between RFE and Korea is accounted for by non-tariff barriers, which to some extent are also applicable to the trade between Korea and Russia in general.

One of the key non-tariff barriers are the transportation costs which depend on the availability and quality of infrastructure. In Russia, and in RFE in particular, the infrastructure is in poor shape. In many parts of RFE, there are no permanent roads and if such exist, they are often accessible only to vehicles adapted to the roughest road conditions. Bridges across major rivers are few and far apart. For instance, there is not a single bridge across the Amur River that connects China and Russia. Case in point, trade across the Amur intensifies in winter because trucks with goods can cross the frozen river. Furthermore, the Trans-Siberian railway is a major transportation artery across Russia, and indeed Northeast Asia. However, the freight costs on the Russian railways are high enough to deter foreign investors who prefer to use the maritime routes instead. Last but not least, the dismal state of logistical services in Russia means that the railways do not offer a convenient trade route for Asian exports to Europe. The Greater Tumen Initiative and the Eurasia Initiative focus on linking Korea to the transportation network of Russia, which is particularly important as Korea does not share a land border with Russia. However, onerous bureaucratic hurdles involved in handling cargo and insufficient coordination between port and railways services in Russia are certainly contributing to the high border effect between the two countries (Kanaev 2015).

Another major obstacle is that goods produced in Russia are not competitive on world markets (Korenevsky 2004). This creates concerns at the local and national levels in Russia that eliminating trade barriers will expose domestic industries to foreign competition with detrimental effects. This, in turn, inhibits measures aimed at facilitating border controls, building cross-border infrastructure and promoting the integration of RFE regions with their neighbors in Northeast Asia.

Central-local relations in Russia also have an adverse effect. The strong centralization tendencies leave little room for decision making or initiatives at the local level (Glazyryna, Faleichik and Faleichik 2012). The top-down approach of the federal government often leads to resistance and inertia on the local level. National-level initiatives for cross-border integration create a lot of media attention but often prove ineffective over the long run due to lack of enthusiasm, financial

funds or infeasibility at the local level. At the same time, local politicians who derive advantages from the inefficiencies of the institutional and economic system are reluctant to conduct reforms.

Surveys have indicated that production costs, transportation, and red-tape are the biggest problems for Korean businesses in Russia (Lee et al. 2010). Inefficiencies in the legal and institutional environment, bureaucratic procedures that breed corruption and red tape, lack of support from local authorities for foreign investors, and the lack of funds to provide adequate transportation infrastructure and other public goods create risks and do not contribute to a favorable environment for trade and investment. All of these factors are reflected in the border effects reported in the previous section.

## VI. Conclusions

Korea and Russia find themselves at a major crossroads in the second decade of the 21st century. Korea as a highly developed economy and a member of the OECD club looks for more efficient ways to distribute its goods and services across the globe and to invest in profitable projects abroad. The deterioration of Russia's relations with Europe and the US has led to a strategy focused on fostering closer relations with Northeast Asia. Russia's exports of natural resources and its demand for manufactured goods from abroad exhibit major complementarities with the economies of China, Korea and Japan, which in turn seek cheap resources for their manufacturing sectors. This paper examined the extent of economic links between Korea and Russia relative to other countries in a gravity model framework that employs trade data over the period 1992-2014.

The results of the empirical analysis provide a mixed picture. At the level of countries, the barriers to trade between Korea and Russia are significantly higher

than between Korea and any other of its trading partners in the West or in East Asia. While these adverse border effects have been on the decline in recent years, they remain on average high and amount to a tariff of about 40% in addition to the trade barriers faced by Korea's other major trading partners. While Korea has concluded FTAs with major global economies, Russia's entry into the WTO seems to have had little impact on its trade with Korea relative to other major Western and East Asian economies.

The paper also explores the trade between Korea, RFE and the rest of Russia. This regional dimension of the analysis indicates that RFE and the rest of Russia are better integrated with each other than anyone of them is with Korea. This is understandable given that they are part of one country but the lack of a significant difference in the border effects also means that RFE does offer any particular benefits as a hub of Russia's integration with Northeast Asia beyond geographical proximity. However, the results show that the border effect between RFE and Korea has decreased over time and that it has in fact disappeared in the early 2010s. In contrast, Korea's border effect with the rest of Russia has remained largely constant. This seems to indicate that the national, bilateral, and multilateral initiatives aimed at fostering regional integration in NEA, and between Korea and Russia in particular, are beginning to have a positive effect. The conclusion is that RFE's integration with Korea is intensifying and offers hope for a mutually beneficial relationship in the future.



## References

- Anderson, J. 1979. "A Theoretical Foundation for the Gravity Equation." *American Economic Review*, 69(1), 106-116.
- Anderson, J., and E. Van Wincoop. 2003. "Gravity with Gravitas: A Solution to the Border Puzzle." *American Economic Review*, 93(1), 170-192.
- Baldwin, R. and D. Taglioni. 2006. "Gravity for Dummies and Dummies for Gravity Equations." *NBER Working Papers*, 12516.
- Feenstra, R. 2002. "Border Effects and the Gravity Equation: Consistent Methods for Estimation." *Scottish Journal of Political Economy*, 49(5), 491-506.
- Glazyryna, I.P., Faleichik, A.A., and L.M. Faleichik. 2012. "Cross-Border Cooperation in the Light of Investment Processes: More Minuses Than Pluses So Far." *Problems of Economic Transition*, 55(6), 43-62.
- Head, K. and J. Ries. 2001. "Increasing Returns versus National Product Differentiation as an Explanation for the Pattern of U.S.-Canada Trade." *American Economic Review*, 91(4), 858-876.
- Izotov, D. 2014. "Program for Regional Cooperation between Russia's Far East and China's Northeast: Present and Future." *Spatial Economics*, 2, 149-176.
- Jeh, S.-H. 2015. "Russian Far East Development and Directions for Improvement in Korean-Russian Cooperation: Korea's Perspective." In *International Cooperation in the Development of Russia's Far East and Siberia*. J. Huang and A. Korolev eds. 144-163, London/New York: Palgrave Macmillan.
- Jeh, S.-H. and Kang, B.-G. 2013. "The Putin Administration's Far East Development Plans and the Future of Korea-Russia Cooperation." *KIEP World Economy Update* 13-26.
- Jeh, S.-H., Min, J.-Y., Kang, B.-G., and S. Lukonin. 2014. "Russia's Development of the Far East and the Baikal Region and Korea's Countermeasures." *KIEP Policy Analysis Paper*, 14/23.

- Korenevsky, K. 2004. "Russia-Korea Trade and Investment Cooperation: Current Tendencies and Perspectives." (Unpublished research paper, Vladivostok, Russia: Department of World Economy, Far Eastern State Academy of Economics and Management).
- Kanaev, E. 2015. "Developing Russia's Far East and Siberia: The Interplay of National, Regional, and Global Implications." In *International Cooperation in the Development of Russia's Far East and Siberia*. J. Huang and A. Korolev eds. 19-37, London/New York: Palgrave Macmillan.
- Lee, J.-Y. 2004. "Iron Silkroad: Prospects for a Landbridge through Russia from Korea to Europe." *Post-Soviet Affairs*, 20(1), 83-105.
- Lee, J.-Y. 2015. "Korea's Eurasia Initiative and the Development of Russia's Far East and Siberia." Korea Institute for International Economic Policy. Mimeo.
- Lee, J.-Y., Minakir, P., Lee, C.-W., and J. Hwang. 2010. "The 20 Years of Korea-Russia Far Eastern Economic Cooperation: new vision and its realization." *KIEP Policy Analysis Paper*, 10/16.
- Olivero, M. and Y. Yotov. 2012. "Dynamic Gravity: Endogenous Country Size and Asset Accumulation." *Canadian Journal of Economics*, 45(1), 64-92.
- Wang, W. 2014. "Regional Integration in Northeast Asia." In *Financing Economic Integration and Functional Cooperation for Northeast Asia toward a Northeast Asian Economic Community*. L.-J. Cho and C.-J. Lee eds. 171-182, Seoul: Korea Institute for International Economic Policy.



2015 KIEP Visiting Fellows Program



---

## 2015 KIEP Visiting Fellows Program

**KIEP** Korea Institute for International  
Economic Policy

[30147] Building C, Sejong National Research Complex, 370,  
Sicheong-daero, Sejong-si, Korea  
T. 82-44-414-1042 F. 82-44-414-1001 • [www.kiep.go.kr](http://www.kiep.go.kr)