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The Impact of South Korean Direct Investments in the Russian Far East on the Improvement of Their Bilateral Export-Import Activities

Han-Sol Lee[1] ✉, **Ekaterina A. Degtereva**[1,2], **Sergey U. Chernikov**[1]

[1]RUDN University, Moscow, Russian Federation
[2]HSE University, Moscow, Russian Federation
✉li-kh@rudn.ru

Abstract. The Republic of Korea (ROK), due to its geographical proximity to the Russian Far East, has been a close and crucial economic partner of the region alongside other East Asian countries. The increasing of Western sanctions' pressure and the intensification of Russia's activation of the "Pivot to the East" will promote the development of cooperation with the Eastern countries, and the role of Eastern Russia is likely to increase, which will increase the role of Russia's Far Eastern regions. In addition, Western sanctions will direct the country's foreign policy towards import substitution. On the other hand, the relationship between trade and foreign direct investments (FDI), whether it is complementary or substitutive, is rather controversial and thus has long been debated by several scholars: each case study demonstrates a different result depending on the focus country, economic zones, study period, and so forth. In this sense, this study examines the impact of South Korean FDI in the Russian Far East on their bilateral exports and imports for the period Q2 2017 — Q3 2021. Ordinary least squares (OLS) and robust least squares regression analyses confirm that South Korean FDI stock in the Russian Far East promotes the Russian Far East's imports from South Korea, while it shows no statistical significance in its exports to South Korea. In order to contribute to the economic growth of the Russian Far East and create win-win effects, the way South Korean companies invest in the Russian Far East should be reformed to localize their production process.

Key words: foreign direct investment and trade, FDI, substitution relationship, complementary relationship, the Republic of Korea, ROK

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Влияние прямых южнокорейских инвестиций на Дальнем Востоке России на улучшение двусторонней экспортно-импортной деятельности

Хансол Ли[1] ✉, **Е.А. Дегтерева**[1,2], **С.Ю. Черников**[1]

[1]Российский университет дружбы народов, Москва, Российская Федерация
[2]Национальный исследовательский университет «Высшая школа экономики», Москва, Российская Федерация
✉li-kh@rudn.ru

Аннотация. Республика Корея благодаря своей географической близости к российскому Дальнему Востоку является близким и важнейшим экономическим партнером региона наряду с другими странами Восточной Азии. Рост санкционного давления со стороны стран Запада и активизация политики «поворота на Восток» Российской Федерации создали предпосылки для развития сотрудничества с восточными странами, что повышает роль дальневосточных регионов России. Кроме того, санкции стран Запада вернули в повестку дня тему импортозамещения в российской экономике. В этом ключе актуализируется тема взаимосвязи (взаимодополняющей или замещающей) между прямыми иностранными инвестициями (ПИИ) и торговлей. Данный вопрос является дискуссионным и давно анализируется в академических кругах. Исследование посвящено выявлению влияния южнокорейских ПИИ на Дальнем Востоке России на их двусторонний экспорт и импорт за период со второго квартала 2017 г. по третий квартал 2021 г. Применение метода наименьших квадратов (МНК) и робастного регрессионного анализа позволило доказать, что южнокорейские ПИИ на российском Дальнем Востоке способствуют росту импорта Дальнего Востока из Южной Кореи, в то время как они не показывают статистической значимости для экспорта в Южную Корею. Для содействия экономическому росту дальневосточных регионов и создания взаимовыгодных эффектов необходимо реформировать методы инвестирования южнокорейских компаний на Дальнем Востоке с целью локализации их производственного процесса.

Ключевые слова: прямые иностранные инвестиции и торговля, ПИИ, отношения замещения, взаимодополняющие межгосударственные отношения, Республика Корея, РК

Заявление о конфликте интересов. Авторы заявляют об отсутствии конфликта интересов.
Вклад авторов. *Хансол Ли* — подготовка черновика проекта; *Е.А. Дегтерева* — руководство исследованием; *С.Ю. Черников* — подготовка рукописи и ее редактирование.

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Introduction

The remarkable economic growth of the four Asian Tigers, namely, Hong Kong, the Republic of Korea (ROK), Taiwan, and Singapore, based on export-led strategies in the 1990s spurred other developing and transition countries to open their economies and shift their foreign policies from import-substitution to export promotion.

Since Russia joined the World Trade Organization (WTO) in 2012, the country has also actively pursued with the globalization of its economy. However, Western sanctions, caused by the reunification of the Crimea with the Russia in 2014 and the conflict between Russia and Ukraine in 2022, will direct the country's foreign policy towards import substitution; still export is a crucial economic activity for the economic growth of it, whose national economy is largely dependent on natural resources. Especially, for the Russian Far East, where the local market size is very small, the role of export is highly important. In reality, the export dependence (measured by the export-to-Gross Regional Product (GRP) ratio) of the Far Eastern Federal District has been over that of all federal subjects (Table 1) for the period 2017–2020. Although the export-to-GRP ratio of the Russian Far East was lower than that of all federal subjects in 2021, it should be considered as a

mere exception. In fact, after the outbreak of the conflict between Russia and Ukraine, international freight flows were reoriented to the Far Eastern ports in 2022: the Far Eastern sea gateways' share in container turnover increased from 40 to 70%, and transportation to Belarus through the Russian Far East increased by 77% in September 2022 from September 2021.[1] In this sense, the promotion of exports and the maintenance of a favorable trade balance are of great importance for the economic growth of the Russian Far East.

Table 1

Export-to-GRP Ratio, 2017–2021, %*

Year	2017	2018	2019	2020	2021
Russia	26.18	31.23	28.90	25.88	29.87
Far East	27.73	32.69	31.26	28.66	28.81

Note. * — The conversion of GRP from the ruble to USD term by applying the annual average exchange rate from the following source: Dynamics of the Official Exchange Rate of a Given Currency // The Central Bank of the Russian Federation. (In Russian). URL: https://www.cbr.ru/currency_base/dynamics/?UniDbQuery.Posted=True&UniDbQuery.VAL_NM_RQ=r01235 (accessed: 10.03.2024).

Source: Information for Monitoring the Socio-Economic Situation of the Subjects of the Russian Federation January-December 2023 // Federal Service for State Statistics. February 2024. (In Russian). URL: https://rosstat.gov.ru/folder/11109/document/13259 (accessed: 10.03.2024); GRP from 1998 // Federal Service for State Statistics. March 2024. (In Russian). URL: https://rosstat.gov.ru/statistics/accounts (accessed: 10.03.2024).

South Korea, due to its geographical proximity to the Russian Far East, has been a close and crucial economic partner of the region, alongside other East Asian countries, namely China and Japan. The worsening of Western sanctions and the activation of the "Pivot to the East" policy of the Russian Federation will enhance national ties with the Eastern countries, and the role of Eastern Russia is likely to increase. In reality, despite the global COVID-19 pandemic, South Korean foreign direct investment (FDI) in Russia has not been significantly affected by it. In contrast to the sharp decline in global FDI flows during the COVID-19 pandemic period, South Korean gross FDI outflows to Russia increased from 99 million USD in 2019, to 125 million USD in 2020, and 129 million USD in 2021 (the highest amount of FDI flows since 2016). The highest FDI flows in the year 2021 confirmed that South Korean FDI in Russia has shown a strong, consistent upward trend since 2016. From here, we can expect a strong resilience of South Korean FDI in Russia in the post-pandemic era.[2]

On the other hand, the relationship between trade and FDI, whether it is complementary or substitutive, is rather controversial and thus has long been debated by multiple scholars: each case study demonstrates a different result depending on the focus country, economic zones, study period, etc. (Mundell, 1957; Kojima, 1975; Blonigen, 2001; Liu, Wang & Wei, 2001; Marchant, Cornell & Koo, 2002; Pantulu & Poon, 2003).

This research investigates the impact of South Korean investment on bilateral exports and imports between South Korea and the 11 federal subjects of the Russian Far Eastern Federal District based on the quarterly data for the period 2017–2021 by using ordinary least squares (OLS) and robust regression analysis. Structurally, the aticle consists of several sections devoted to the description of inward FDI in the Russian Far East, as well as consideration of South Korea as an investor country; analysis of exports and imports in the Russian Far East, characteristics of South Korea as a partner country; literature review; methodology and results of empirical tests. Finally, conclusions and recommendations are presented.

Foreign Direct Investment in the Russian Far East and the Place of South Korea as an Investing Country

The FDI stock in the Russian Far East (around 88%) was directed from offshore countries, and there is a high rate of trans-shipping, round-tripping or fictious FDI, which

[1] Economic Shifts: The Far East Poses a Threat to GDP // KONKURENT.RU. February 29, 2022. (In Russian). URL: https://konkurent.ru/article/53891 (accessed: 03.11.2022).

[2] Statistics of FDI // The Export-Import Bank of Korea. URL: https://stats.koreaexim.go.kr (accessed: 26.06.2022).

makes it rather difficult to clarify the real source countries of FDI.[3] Hence, despite the seemingly modest level of South Korean FDI in the Russian Far East, from 2015 to 2022, South Korea was listed as one of the consistent authentic investors (Table 2).

Table 2

Share of FDI Stock in the Russian Far East (Far Eastern Federal District) by Partner Countries, 2015 and 2022, %

Country	January 1, 2015	January 1, 2022
Bermuda	34.76	63.06
Bahamas	50.13	22.14
Cyprus	5.11	3.17
South Korea	0.38	0.18
Netherlands	0.00	1.31
United Kingdom	0.67	0.00
Japan	0.12	0.22
China	0.17	0.86
Hong Kong	0.05	0.11
Others	0.82	0.20
Undefined	7.79	8.74

Source: Balances by Subjects of the Russian Federation by Instruments and Partner Countries // Central Bank of Russia. September 2022. (In Russian). URL: https://www.cbr.ru/statistics/macro_itm/svs/ (accessed: 22.09.2023).

South Korean FDI stock in Russia is mainly concentrated in three federal districts: the Central Federal District, North-Western Federal District, and the Far Eastern Federal District. The Far Eastern Federal District is the third destination of South Korean FDI in Russia (Figure 1).

South Korean FDI is concentrated in non-energy sectors, such as services (finance, transport, logistics, accommodation), trade, distribution (electronics, food and beverages), and agriculture. It is also notable that Vladivostok in Primorsky Krai is the most preferred location. This indicates that South Korean investors are interested in market expansion when choosing investment locations in the Far East (Lee, 2020).

As of the beginning of 2022 in Figure 2, the largest amount of South Korean FDI stock was accumulated in Primorsky Krai and Khabarovsk Krai, where there are attractive regional demand conditions in terms of market size and population relative to other federal subjects of the Far Eastern Federal District. Sakhalin Region is less significant for South Korean investors. Therefore, we can postulate that South Korean market-seeking FDI is larger than natural resource-seeking FDI in the Far Eastern Federal District. The sluggish South Korean investments in Sakhalin Region, despite the existence of large-scale energy projects, can be explained by the limited number of world-class South Korean energy companies which operate both upstream and downstream industries. In detail, only five South Korean companies entered the global energy ratings of the *Standard & Poors*: *SK Innovation* (46th), *KEPCO* (124th), *GS Holdings* (127th), *KOGAS* (128th), and *S-Oil* (191st).[4] But, it should be noted that *S-Oil*'s holding company is *Aramco* (Saudi Arabia) and *GS Holding*'s business is limited to the downstream industry. However, as we can see, the number of such comprehensive energy companies is limited in South Korea, so the handling of work that requires a high level of technical expertise and enormous capital is limited.

In addition, the South Korean FDI stock in the 4 Far Eastern federal subjects maintained a constant level during the COVID-19 pandemic period. It is worth noting that before the outbreak of the COVID-19 pandemic, South Korean FDI stock in the Primorsky Krai increased from 144.01 million USD (as of January 1, 2019) to 172 million USD (as of January 1, 2020). As the progress of the pandemic intensified, in the beginning, South Korean FDI stock was affected as it decreased from 172 million USD (as of January 1, 2020) to 149.23 million USD (as of January 1, 2021) and 144.53 million USD (as of January 1, 2022). However, it did not go below that of January 1, 2019, as the COVID-19

[3] Ledyaeva S., Karhunen P., Whalley J. If Foreign Investment Is Not Foreign: Round-Trip Versus Genuine Foreign Investment in Russia // Centre d'Études Prospectives et d'Informations Internationales. 2013. No. 5. P. 1–65. URL: http://cepii.fr/pdf_pub/wp/2013/wp2013-05.pdf (accessed: 26.06.2023). See also: (Lee & Yu, 2023).

[4] The Platts Top 250 Global Energy Company Rankings // S&P Global Platts. 2019. URL: https://web.archive.org/web/20210602150636/https://www.spglobal.com/platts/top250/rankings/2019 (accessed: 25.05.2023).

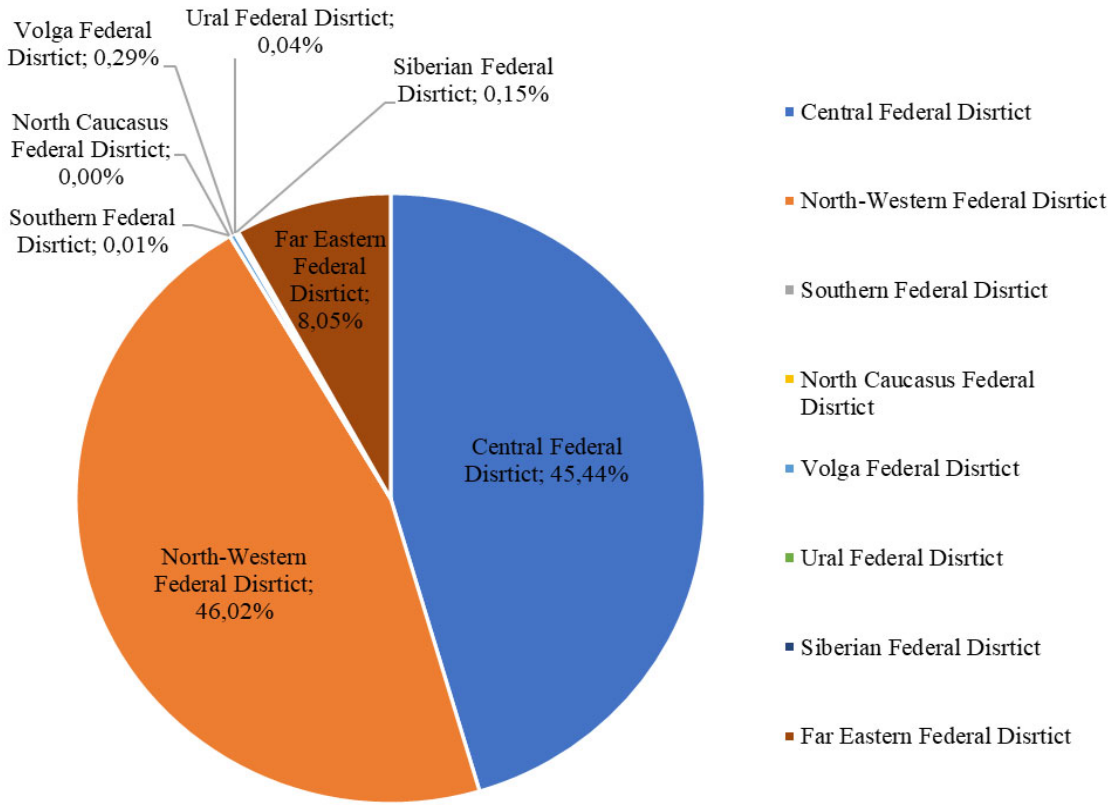


Figure 1. South Korean FDI Stock in Russia by Federal District, as of January 1, 2022, %
Source: Balances by Subjects of the Russian Federation by Instruments and Partner Countries // Central Bank of Russia. September 2022. (In Russian). URL: https://www.cbr.ru/statistics/macro_itm/svs/ (accessed: 22.09.2023).

restrictions in Russia have been relieved, including the border restrictions. On the other hand, we can witness a downward tendency of South Korean FDI in the Khabarovsk Krai. However, this decrease is not due to the pandemic, as it had already happened in the pre-pandemic period. A decrease in the stock of South Korean FDI in the Khabarovsk Krai can be observed between January 1, 2019 and January 1, 2020. Despite the fact that the decrease continued during the pandemic, the volume of the decrease is not significant.

In addition, in the long-term perspective, it is expected that the South Korean FDI in the Russian Far East will be enhanced considering the increasing inclination of the South Korean FDI in the Primorsky Krai — which is the main destination of the South Korean FDI among the Far Eastern federal subjects in the pre-pandemic period, and the de-globalization trend (or intensified economic cooperation among neighboring economies) in the post-pandemic period.

In fact, South Korean shipbuilding companies are actively cooperating with the *Zvezda Shipyard — Hyundai Heavy Industries* is currently building seven tankers, and *Samsung Heavy Industries* established its subsidiary in Russia to conduct a building project of icebreakers. In addition, about twenty South Korean companies mainly in the auto parts and food processing industries are going to enter the upcoming South Korean industrial complex in the Primorsky Krai. There are also active discussions on expanding partnerships in new and emerging investment areas (such as smart cities, smart farms, and renewable energy).[5]

[5] Acting Consul General Ko Ko Hee Gave a Special Interview to the Monthly Magazine (OKNO V ATR) (on the Occasion of the Eastern Economic Forum) // Consulate General of the Republic of Korea in Vladivostok. September 1, 2021. (In Russian). URL: https://overseas.mofa.go.kr/viewer/skin/doc.html?fn=20210903042515123.pdf&rs=/viewer/result/202406 (accessed: 19.02.2022).

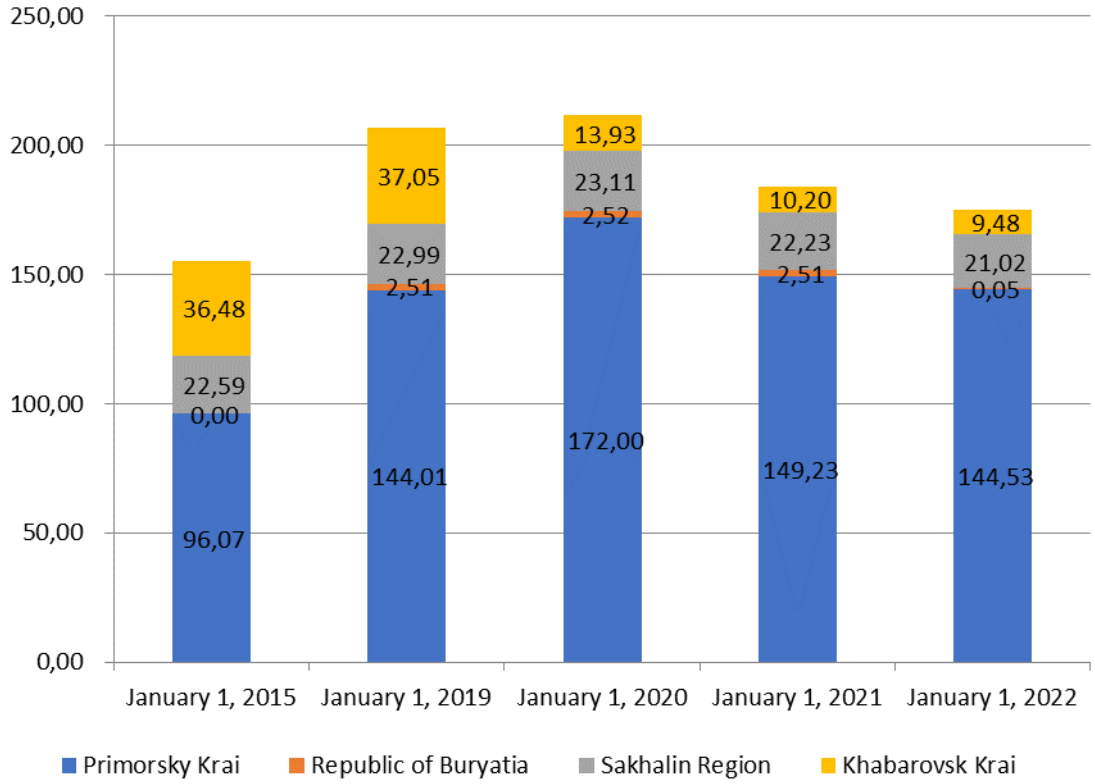


Figure 2. South Korean FDI Stock in the Russian Far East, 2015–2022, million USD
Source: Balances by Subjects of the Russian Federation by Instruments and Partner Countries // Central Bank of Russia. September 2022. (In Russian). URL: https://www.cbr.ru/statistics/macro_itm/svs/ (accessed: 22.09.2023).

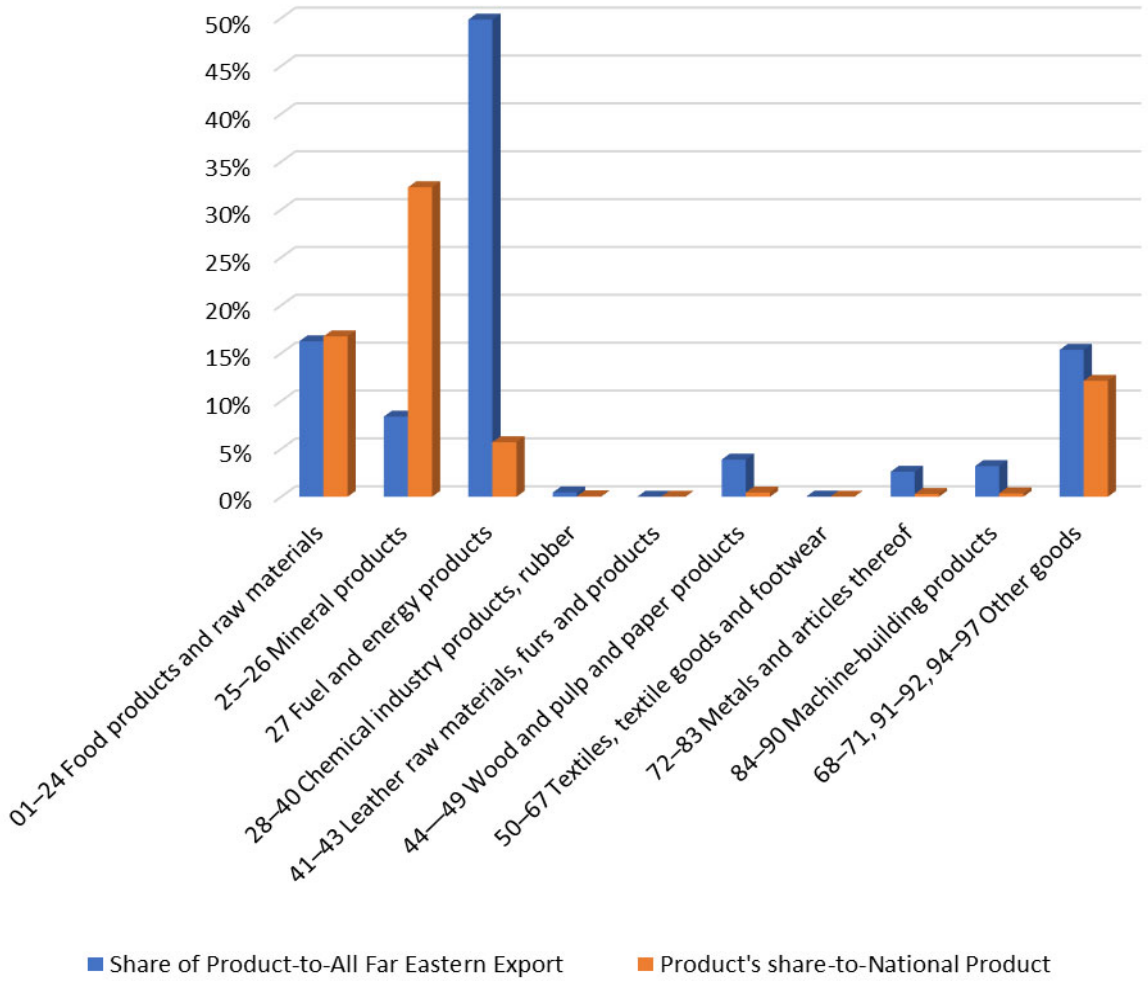
Although the volume of South Korean FDI in the Russian Far East is rather modest compared to other East Asian countries, such as China and Japan, ROK could potentially become one of the most important and stable investor countries in the Russian Far East. The main problems of the Russian Far East can be reduced to asymmetric development of industries and industrial structure, which is not always optimal for the region. The structure of South Korean FDI in the Russian Far East in terms of the distribution by industry particularly clearly demonstrates that South Korea is a potential partner in terms of the diversification of international investments for the balanced economic development of the regions of the Far East. The investments in the Russian Far East will bring multiple benefits for South Korea, such as expanding its presence in foreign markets, creating production manufacturing and sales opportunities for small and medium-sized enterprises (SMEs), and searching for promising industries using new technologies. In particular, investment in the energy and food sectors in the Russian Far East will secure natural resources and food supplies for South Korea. It's worth noting that South Korea is the second largest trading partner in the Russian Far East. The main products that South Korea imports from the Russian Far East are natural resources (oil, gas, coal) and fish.[6]

Exports and Imports in the Russian Far East and a Place of South Korea as a Partner Country

This study analyzes the export potential of industrial goods and services in the Russian Far East (as shown in Figure 3). To estimate the

[6] Acting Consul General Ko Ko Hee Gave a Special Interview to the Monthly Magazine (OKNO V ATR) (on the Occasion of the Eastern Economic Forum) // Consulate General of the Republic of Korea in Vladivostok. September 1, 2021. (In Russian). URL: https://overseas.mofa.go.kr/viewer/skin/doc.html?fn=20210903042515123.pdf&rs=/viewer/result/202406 (accessed: 19.02.2022).

export potential, two indices are used: the first one is a ratio of the product to the total export of the Far East (A; %); while the second one is a ratio of a product in the Russian Far East to a product in all Russia (B; %). After calculating each indicator, an average of them is obtained to clarify the export potential (C; %). The results are presented in Figure 3. The industrial products with the highest export potential are fuel and energy products (code: 27) and mineral products (code: 25–26): they obtained 27.77% and 20.355% of the total export potential indices, respectively. In addition, food products and raw materials (code: 01–24) also have a potential for exporting and they obtained 16.499% from the export potential evaluation.



Code	01–24	25–26	27	28–40	41–43	44–49	50–69	72–83	84–90	68–71, 91–92, 94–97*
A	16.247	8.379	49.842	0.450	0.001	3.889	0.017	2.620	3.207	15.348
B	16.751	32.331	5.699	0.051	0.000	0.445	0.002	0.300	0.367	12.112
C	16.499	20.355	27.770	0.251	0.001	2.167	0.009	1.460	1.787	13.730

Figure 3. Export Potential by a Product in the Russian Far East, 2021, %

Note. * — 68 — articles made of stone, gypsum, cement, asbestos, mica or similar materials; 69 — ceramic products; 70 — glass and its products; 71 — pearls, precious or semi-precious stones, precious metals and articles made of them; jewelry; coins; 91 — watches of all kinds and their parts; 92 — musical instruments; their parts and accessories; 94 — furniture; bedding, stuffed furniture accessories; lamps and lighting equipment; prefabricated building structures; 95 — toys, games and sports equipment; their parts and accessories; 96 — various finished products; 97 — works of art, collectibles and antiques.

Source: The Far Eastern Customs Administration. (In Russian). URL: http://dvtu.customs.gov.ru/ (accessed: 26.06.2022); The Federal Customs Service of the Russian Federation. (In Russian). URL: https://customs.gov.ru/ (accessed: 26.06.2022).

Table 3

Top 10 Trading Partners of the Russian Far East in 2021

No.	Country	Export		Country	Import	
		Million USD	Share, %		Million USD	Share, %
1	South Korea	8,999.45168	32.36	China	5,152.906314	50.92
2	China	8,738.00285	31.42	South Korea	1,325.733404	13.10
3	Japan	4,011.34728	14.43	Japan	1,258.745343	12.44
4	Belgium	1,536.38767	5.53	Kazakhstan	378.619427	3.74
5	United Arab Emirates	1,069.5724	3.85	United States	322.542448	3.19
6	India	923.50148	3.32	Germany	235.408211	2.33
7	Kazakhstan	735.463003	2.64	Hong Kong	161.355598	1.59
8	Taiwan	600.571506	2.16	Turkey	125.031579	1.24
9	Israel	238.853749	0.86	Vietnam	121.193776	1.20
10	Philippines	206.361214	0.74	Taiwan	116.849243	1.15

Source: The Far Eastern Customs Administration. (In Russian). URL: http://dvtu.customs.gov.ru/ (accessed: 26.06.2022).

Due to geographical proximity and sizable domestic economies, the three East Asian countries (namely, ROK, China, and Japan) are the main trading partners of the Russian Far East (Table 3). The Russian Far East exports the most to South Korea, which amounts to 8.999 billion USD in 2021 and followed by China (8.738 billion USD) and Japan (4.011 billion USD). While the Russian Far East imports predominantly from China, which amounts to 5.153 billion USD and accounts for 50.92% of the total in 2021.

Literature Review

The impact of FDI on international trade, whether they have a complementary or substitutive relationship, has long been discussed. In contrast to the clear substitution relationship of other forms of FDI inflows (strategic alliance, licensing and franchising) due to their inherent characteristics, the relationship between FDI and exports is rather uncertain, as multinational enterprises can use both methods simultaneously. The theoretical roots of this type of debate can be found in Mundell (1957) and Kojima (1975).

The early study on this topic was conducted by Mundell (1957). International trade is activated due to different factor endowments between countries (Heckscher — Ohlin — Samuelson assumptions). Since FDI allows international capital movements, the difference in factors will be reduced between countries. Thereby, he demonstrated that FDI will substitute exports. While Kojima (1975) contradicts Mundell's theory and proved the export-creating effects of FDI. International companies invest in a pro-disadvantage industry to utilize factors, which they are poorly endowed in a home country, and the investment leads to the improvement of the production capabilities of an FDI host country through spillover effects. Meanwhile, the investing companies can concentrate on producing goods in which they already have an advantage. FDI thus complements exports.

Although a plethora of empirical studies are carried out, there are empirical evidence for both substitution (Blonigen, 2001; Bhasin & Paul, 2016) and complementarity (Pfaffermayr, 1996; Liu, Wang & Wei, 2001; Marchant, Cornell & Koo, 2002; Pantulu & Poon, 2003; Limaye & Pednekar, 2019) relationships, and thus the debate on this topic continues.

Interestingly, some studies demonstrate the existence of both relationships in one case. Liu et al. (2016) demonstrated that FDI has a different impact on exports between China and Organization for Economic Co-operation and Development (OECD) countries, depending on the stage of its maturity. In the early stage of development, FDI complements exports. As the stage of FDI is developed, the ratio of exports to FDI is reduced, and FDI substitutes exports. Oberhofer and Pfaffermayr (Oberhofer &

Pfaffermayr, 2012), in their study of European companies, define productivity as a factor of exports or FDI decisions. A more productive company invests abroad, while a less productive company exports goods. This finding supports a substitution relationship between exports and FDI, but companies still can use both strategies. The study found a complementary relationship exists in the most horizontally integrated companies. Fillat-Castejón, Francois, and Wörz, in their study of service sectors, also demonstrated mixed results.[7] Although, a complementary relationship was revealed for all service industries, a substitution relationship was exceptionally found in transport and construction services.

To conclude, the relationship between FDI and trade is still uncertain. A summary of the previous empirical studies is presented in Table 4.

Data Description and Research Hypothesis

For the mathematical analysis, quarterly data ranging from Q2 2017 — Q3 2021 are constructed. The model specifications are as follows:

$$Ln(export)_{ktq} = \beta_0 + \beta_1 Grw_{FDI_{ktq}} + \\ + \beta_2 exrate_{tq} + \varepsilon_{it}; \quad (1)$$

$$Ln(import)_{ktq} = \\ = \beta_0 + \beta_1 Grw_{FDI_{ktq}} + \beta_2 exrate_{tq} + \varepsilon_{it}; \quad (2)$$

$$Grw_{export_{ktq}} = \beta_0 + \beta_1 Grw_{FDI_{ktq}} + \\ + \beta_2 exrate_{tq} + \varepsilon_{it}; \quad (3)$$

$$Grw_{import_{ktq}} = \beta_0 + \beta_1 Grw_{FDI_{ktq}} + \\ + \beta_2 exrate_{tq} + \varepsilon_{it}, \quad (4)$$

where $Ln(export)_{ktq}$ is the natural logarithm of the export (in million USD, current prices) from the Russian Far East to South Korea in year *t* and quarter *q*;

$Ln(import)_{ktq}$ is the natural logarithm of import (in million USD, current prices) from South Korea to the Russian Far East in year *t* and quarter *q*;

Grw_export_{ktq} is the growth rate of the share of exports from the Russian Far East to South Korea in year *t* and quarter *q*;

Grw_import_{ktq} is the growth rate of the share of imports from South Korea to the Russian Far East in year *t* and quarter *q*;

Grw_FDI_{ktq} is the growth rate of South Korean FDI stock in the Russian Far East in year *t* and quarter *q*.

To calculate the growth rate, the FDI stock in nominal prices is transformed in real prices by applying a quarterly GDP deflator (nominal GDP÷real GDP×100, base year = 2016). The formula to calculate (per capita) real FDI stock is as follows:

$$Real\ FDI\ = \frac{Nominal\ FDI}{GDP\ deflator} \times 100; \quad (5)$$

$exrate_{tq}$, the exchange rate from the ruble to the dollar in year *t* and quarter *q*, is included as a control variable. A currency value is an important factor to influence trade volumes in that it is closely related to the price competitiveness of exporting and importing goods and services, ε_{it} is an error term.

An expected sign Grw_FDI_{ktq} in each model is presented in Table 5.

Much South Korean FDI in the Russian Far East has been made in the sectors where South Korea lacks strong natural endowments in their home country (e.g., grain agriculture, woods, etc.). Hence, there is a high probability that the investment is oriented to export back to their home country, which is insufficient with and needs such products. Thereby, the expected sign of *Ln(export)* and *Grw_export* is positive.

[7] Fillat-Castejon C., Francois J. F., Wörz J. Cross-Border Trade and FDI in Services // Wiener Institut für Internationale Wirtschaftsvergleiche (wiiw) Working Paper. 2008. No. 50. February 2009. URL: https://www.econstor.eu/bitstream/10419/203915/1/wiiw-wp-050.pdf (accessed: 03.11.2022).

Table 4

Summary of Previous Empirical Studies on the Relationship Between FDI and Trade

Study	Methodology	Country/Year	Findings
Pfaffermayr (1996)	Generalized method of moments (GMM) estimations	Austria (1981–1991)	The complementary relationship between FDI and exports in the Austrian manufacturing sector is substantiated
Blonigen (2001)	Seemingly unrelated regressions (SUR)	Japan — the USA (1978–1991)	Both substitutive and complementary relationships are found for exports of Japanese automobile parts to the US market, while a substitutive relationship is found for exports of final consumer goods
Liu, Wang & Wei (2001)	Causality tests based on vector autoregression (VAR)	China (1984–1998)	Imports cause inward FDI (positively) and in turn cause the growth of exports from China
Marchant, Cornell & Koo (2002)	Two-stage least square	The USA — East Asian countries (1989–1998)	A complementary relationship between FDI and exports is confirmed
Pantulu & Poon (2003)	Ordinary least squares (OLS)	From Japan and the USA to 29 and 32 countries (1996–1999)	FDI creates trading (exports and imports)
Fillat-Castejón, Francois & Wörz*	Panel data analysis (price and cross-price effects)	OECD countries (1994–2004)	A complementary relationship was revealed for the service sector, but a substitution relationship was exceptionally found for transport and construction services
Oberhofer & Pfaffermayr (2012)	Bivariate probit estimation, marginal effect estimation	Companies located in 10 European countries (AMADEUS Top 250,000' database)	A more productive company invests abroad, while a less productive company exports goods, but companies still can use both strategies
Bhasin & Paul (2016)	VAR, cointegration, and causality tests based on VAR	10 Asian countries (1991–2012)	FDI and exports are substitutes
Liu et al. (2016)	A pendulum gravity model	China and OECD countries (1992–2009)	A different relationship between FDI and exports depends on the maturity of the foreign investment
Limaye & Pednekar (2019)	Causality tests based on VAR	The USA — Asian countries (1991–2017)	A positive effect of the US FDI in Japan on exports of the US to Japan is revealed.

Note. * — Fillat-Castejon C., Francois J. F., Wörz J. Cross-Border Trade and FDI in Services // Wiener Institut für Internationale Wirtschaftsvergleiche (wiiw) Working Paper. 2008. No. 50. February 2009. URL: https://www.econstor.eu/bitstream/10419/203915/1/wiiw-wp-050.pdf (accessed: 03.11.2022).
Source: compiled by the authors.

Table 5

An Expected Sign of *Grw_FDI*

Independent variable	
Ln(export), Grw_export	*Ln(import), Grw_import*
Positive	Vague

Source: compiled by the authors.

On the other hand, the Russian government has strongly spurred the industrial localization policies by providing various incentives to foreign companies to localize their production process in Russia.

However, it is uncertain whether South Korean companies actively cooperate with the new foreign policy of Russia in that most of their investment mainly aims at market expansion. Thereby, the expected sign of *Ln(import)* and *Grw_import* is vague.

The descriptive data are presented in Table 6. 18 observations are ranked from Q2 2017 — Q3 2021. The datasets of export and import are obtained from the Federal Statistics Service of the Russian

Federation,[8] while those of FDI and exchange rates are extracted from the Central Bank of the Russian Federation.[9]

Figures 4 and 5 depict the dynamics of exports and FDI from the Russian Far East to South Korea, and imports from South Korea to the Russian Far East in Q2 2017 — Q3 2021. Exports peaked in Q2 2019 (amounted to 3.2 billion USD) and took downward trends afterward, but starkly increased in Q2 2021. The bilateral imports are much lower than exports. Imports dropped dramatically in Q3 2017 from 576 million USD to 157.8 million USD and kept minimally fluctuating afterward but took upward trends from Q2 2021. The share of South Korean exports and imports in the Russian Far East is rather fluctuating throughout the period (Figures 6 and 7). The FDI stock increased sharply in Q1 2018 and peaked in Q3 2019. However, it dropped extremely in Q1 2020 (Figure 8).

Pearson's Correlation Tests and Regression Analysis

Figures 9–12 represent scatter plots and Pearson's correlation coefficients with the p-value. The relationship between *Ln(export)* and *Grw_FDI* is weak and negative: the Pearson's coefficient (*r*) of *Ln(export)* and *Grw_FDI* is –0.361744 without a statistical significance ($p = 0.1402$); that of *Grw_export* and *Grw_FDI* is –0.122955 without a statistical significance ($p = 0.6269$). This indicates that they inversely move, but their movement is not statistically significant.

Meanwhile, the relationship between *Ln(import)* and *Grw_FDI* is strong and positive: Pearson's coefficient (*r*) of *Ln(import)* and *Grw_FDI* is 0.556301 at the 5% significance level; that of *Grw_import* and *Grw_FDI* is 0.785513 at the 1% significance level. This implies that they show co-movement in the same direction and their movement is statistically significant.

Regression analysis with OLS and robust estimators is further conducted. The results are presented in Table 7. *Grw_FDI* is negatively correlated with *Ln(export)* and *Grw_export*. However, it is not statistically significant. This indicates that South Korean FDI in the Russian Far East does not have a special association with its bilateral export (from the Russian Far East to South Korea). While *Grw_FDI* is positively correlated with *Ln(import)* and *Grw_import* at a 1% significance level. This indicates that South Korean FDI in the Russian Far East promotes their bilateral imports (from South Korea to the Russian Far East). The same results were found in models with robust estimators.

Regardless of the dependent variables, the results are consistent. If we look at imports from South Korea to the Russian Far East, outward FDI (from South Korea) has complementary effects, which is in line with the results of previous studies of Kojima (1975), Marchant, Cornell & Koo (2002), Pantulu & Poon (2003), Limaye and Pednekar (Limaye & Pednekar, 2019), etc. On the other, if we interpret the results from the perspective of the Russian Far East, inward FDI from South Korea does not contribute to increasing their exports to South Korea, and this result is exactly contradicting the previous findings from the study of Liu, Wang and Wei (Liu, Wang & Wei, 2001), Zhang and Song (Zhang & Song, 2001), Li et al. (2017). Sahoo & Dash (2022) demonstrated that to induce positive effects of FDI on exports other related factors, such as infrastructure, financial sector development, trade openness, human capital, institution and exogenous sector stability should be well established. Like our paper, Sultan (2013) also did not find the significant effect of FDI on exports.

[8] Federal Service for State Statistics. (In Russian). URL: https://rosstat.gov.ru/statistics/accounts (accessed: 10.03.2024).

[9] Central Bank of Russia. (In Russian). URL: https://www.cbr.ru/statistics/macro_itm/svs/ (accessed: 22.09.2022).

Table 6

Descriptive Data

Variable	Mean	Max	Min	St. Dev.	Obs.
Ln(export)	7.569162	8.058848	6.688366	0.338956	18
Ln(import)	5.180382	6.356186	4.725394	0.426184	18
Grw_export	3.261556	115.5980	–34.84800	32.42017	18
Grw_import	17.02673	273.9836	–61.97716	72.15708	18
Grw_FDI	8.551011	136.4557	–16.43050	35.40478	18
exrate	0.015204	0.017584	0.013122	0.001465	18

Source: compiled by the authors.

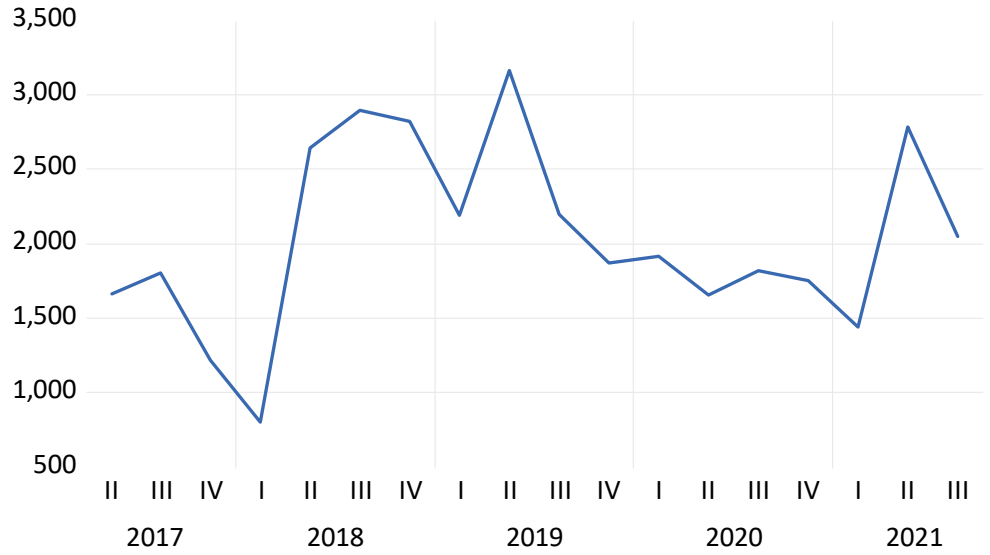


Figure 4. Exports from the Russian Far East to South Korea, Q2 2017 — Q3 2021, million USD
Source: reproduced by the authors from Eviews 12.

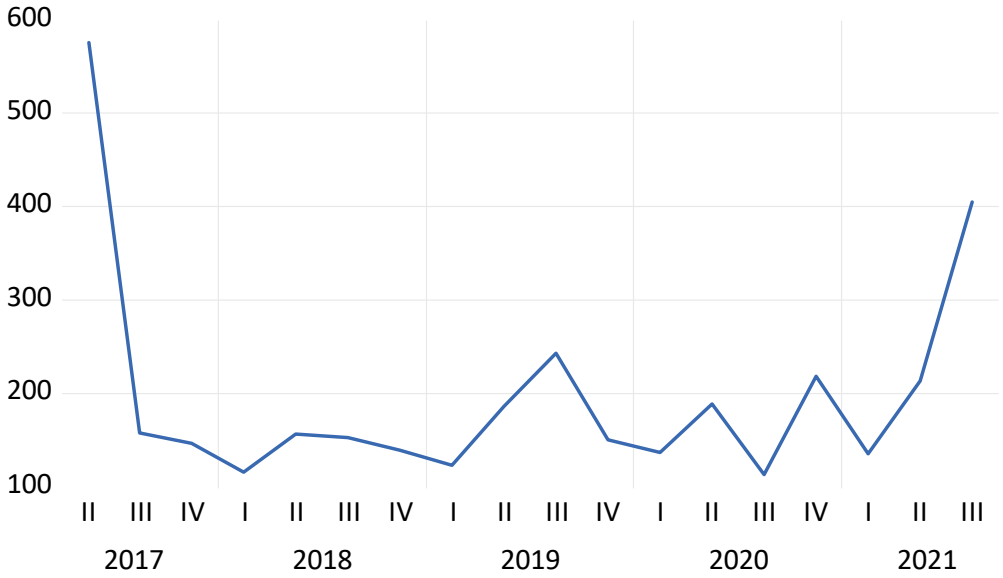


Figure 5. Imports from South Korea Russian Far East, Q2 2017 — Q3 2021, million USD
Source: reproduced by the authors from Eviews 12.

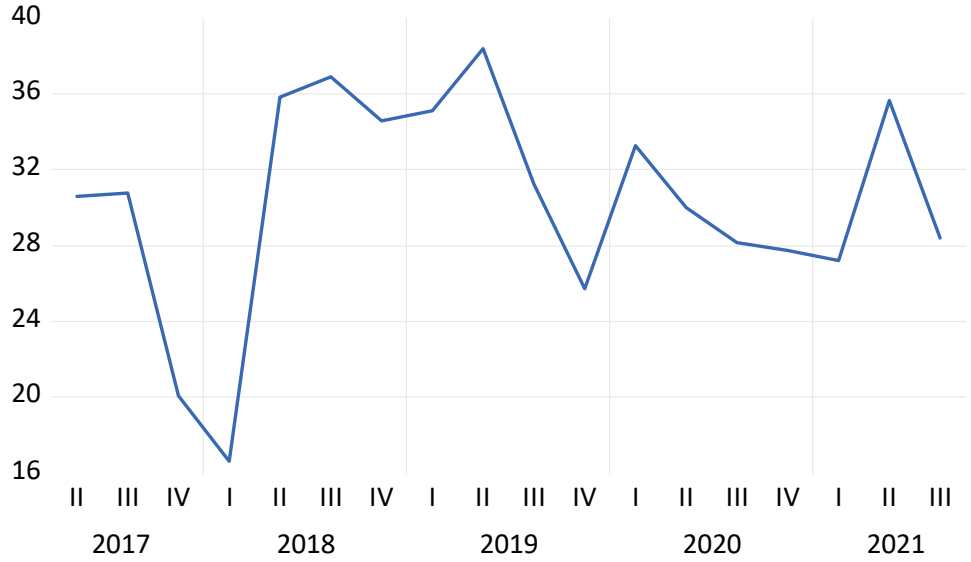


Figure 6. Share of Exports to South Korea in the Russian Far East, Q2 2017 — Q3 2021, %

Source: reproduced by the authors from Eviews 12.

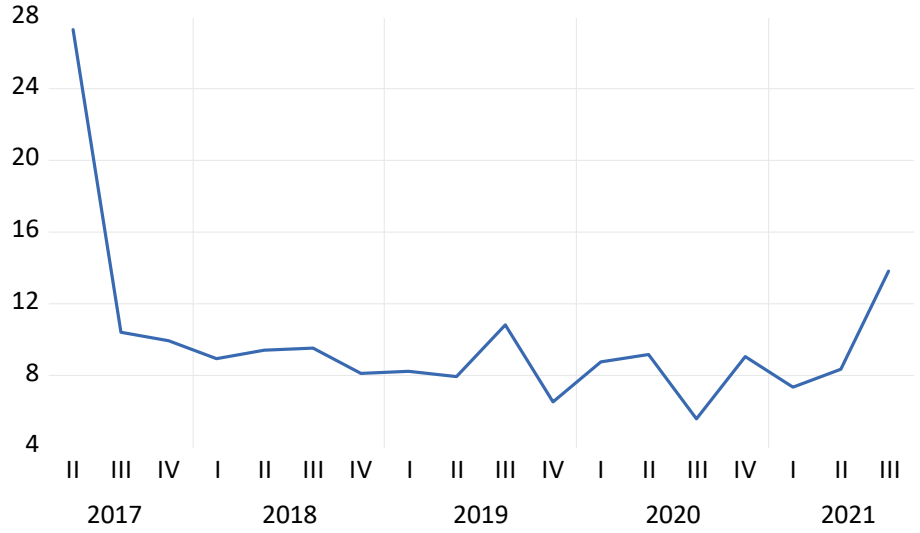


Figure 7. Share of Imports from South Korea in the Russian Far East, Q2 2017 — Q3 2021, %

Source: reproduced by the authors from Eviews 12.

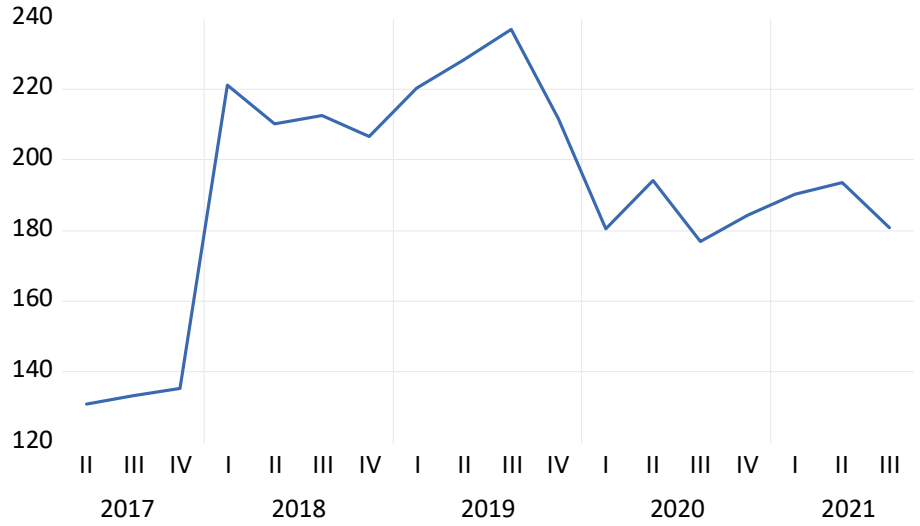


Figure 8. South Korean FDI Stock in the Russian Far East, Q2 2017 — Q3 2021, million USD

Source: reproduced by the authors from Eviews 12.

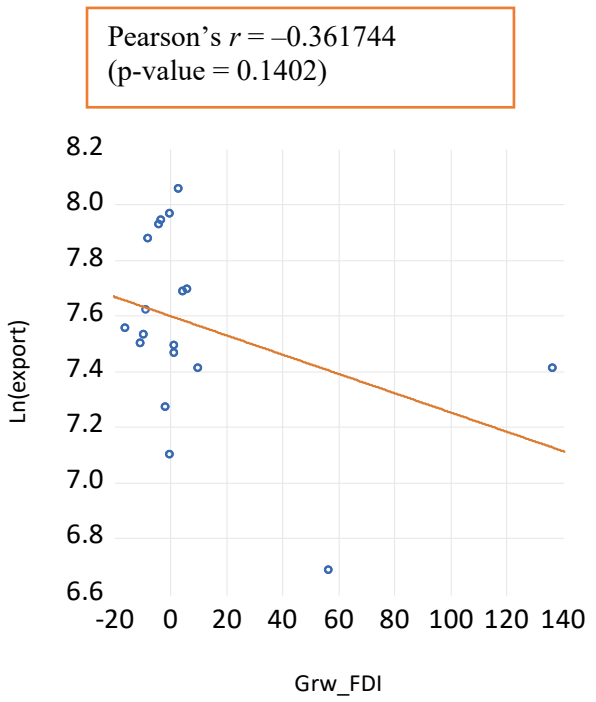


Figure 9. Scatter Plots with Regression Line and Pearson's Correlation Coefficients Between *Grw_FDI* and *Ln(export)*
Source: reproduced by the authors from Eviews 12.

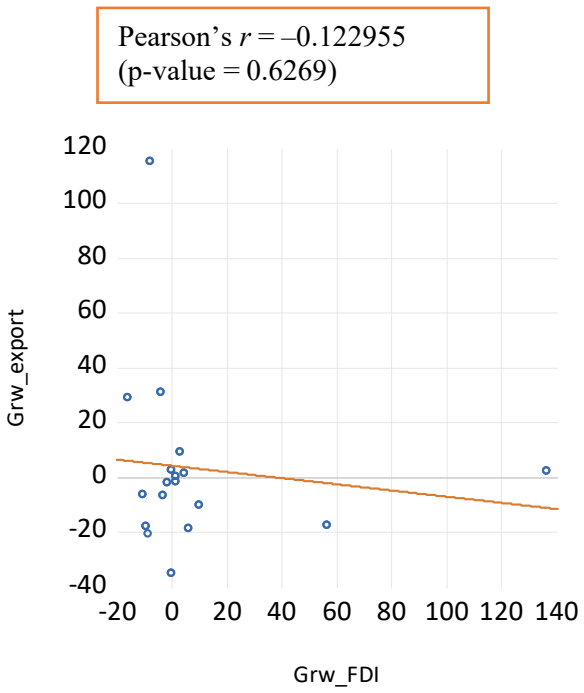


Figure 10. Scatter Plots with Regression Line and Pearson's Correlation Coefficients Between *Grw_FDI* and *Grw_export*
Source: reproduced by the authors from Eviews 12.

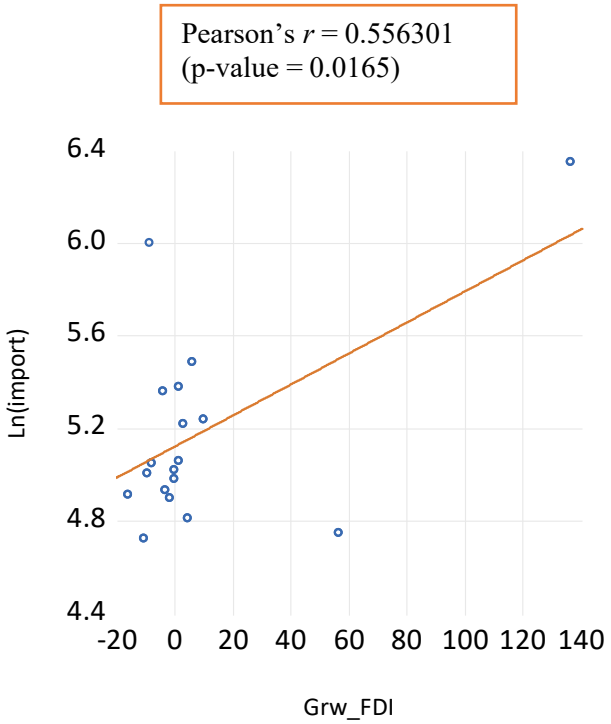


Figure 11. Scatter Plots with Regression Line and Pearson's Correlation Coefficients Between *Grw_FDI* and *Ln(import)*
Source: reproduced by the authors from Eviews 12.

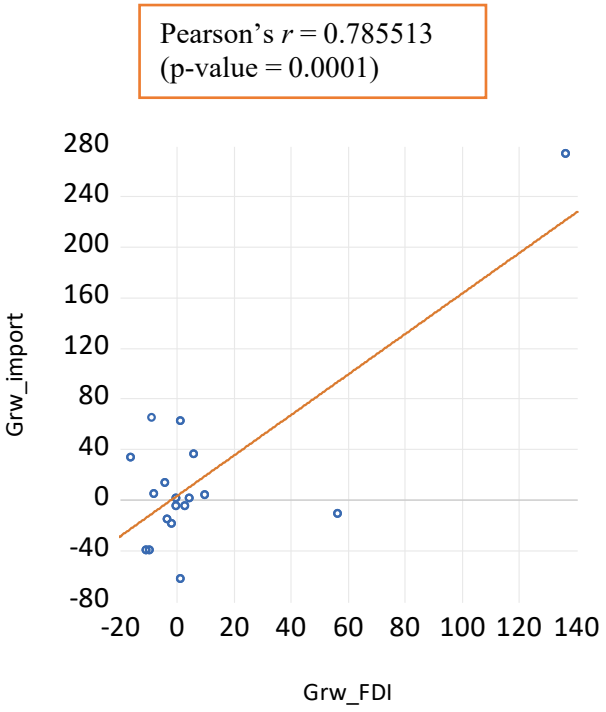


Figure 12. Scatter Plots with Regression Line and Pearson's Correlation Coefficients Between *Grw_FDI* and *Grw_import*
Source: reproduced by the authors from Eviews 12.

Table 7

Regression Results

Variable	*Ln(export)*		*Grw_export*		*Ln(import)*		*Grw_import*	
	(1) OLS	(2) Robust	(3) OLS	(4) Robust	(5) OLS	(6) Robust	(7) OLS	(8) Robust
Grw_FDI	–0.002551	–0.002282	–0.164288	0.091695	0.009181***	0.009915***	1.962799***	1.997306***
	(0.002680)	(0.002773)	(0.275472)	(0.151035)	(0.002794)	(0.001884)	(0.340987)	(0.356948)
Exrate	–41.64623	36.79936	2359.420	–3658.828	–113.3733	–28.03321	–16515.61*	–15478.12*
	(64.78539)	(67.02981)	(6658.676)	(3650.798)	(67.52842)	(45.54900)	(8242.289)	(8628.088)
Constant	8.224169***	7.090831***	–31.20655	49.75412	6.825622***	5.513965***	251.3484*	235.8146*
	(0.976201)	(1.010020)	(100.3344)	(55.01103)	(1.017533)	(0.686342)	(124.1966)	(130.0099)
R^2	0.154161	0.045549	0.023293	0.042116	0.418704	0.177366	0.697896	0.278873
BPG test (p-value)	0.2272	–	0.3100	–	0.6766	–	0.4410	–
LM test (p-value)	0.3126	–	0.1726	–	0.6595	–	0.0803	–
Obs.	18	18	18	18	18	18	18	18

Note. Standard errors in parentheses, *** — p < 0.01, ** — p < 0.05, * — p < 0.1.
Source: calculated by the authors.

These results can be understood as follows. South Korean FDI in the Russian Far East is likely market-seeking investment. Instead of exporting manufactured goods and services back to South Korea, it seems that they are much more willing to sell them at the Far Eastern local markets. In addition, South Korean FDI seems much occupied by horizontal FDIs and even vertical FDIs weak at production localization. Due to this, FDI leads to an increase of imports to the Russian Far Eastern market in the form of finished goods, semi-finished goods, or components.

Conclusions and Policy Implications

This study examines the impact of South Korean FDI in the Russian Far East on bilateral exports and imports between the two countries. Pearson's correlation coefficients indicate a weak negative relationship between FDI stock and export (from the Russian Far East to South Korea) and a strong positive relationship between FDI stock and import (from South Korea to the Russian Far East). This study established regression models with OLS and Robust estimators. The results present that South Korean FDI stock in the Russian Far East promotes Russian Far East's import from South Korea. On the other hand, it does not show any statistical significance between FDI and its exports to South Korea.

At the present time, South Korean FDI stock might be useful for the Russian Far East in that the region attracts foreign capital, which can be used as seed money for regional economic growth. Also, as revealed, the even distribution of South Korean FDI in various sectors of the Russian Far East may contribute to the balanced development of the regional economy.

However, in order to enhance the win-win effect of South Korean FDI, first of all, the way they invest in the Russian Far East should be reformed in a way to localize their production process and create spillover effects in the local economy. In the Russian Far East, there are many natural endowments, which South Korea does not hold in their home market, such as gas, oil, fish, timber, grain, and so forth. These products are closely related to national energy and food security, but South Korean FDI does not seem to utilize their investment to export such critical goods back to its home country. However,

the sectors for South Korean FDI in the Russian Far East are not closely related to their trade: South Korean FDI was rather weak in the energy sectors. In this sense, secondly, to create positive exporting effects from South Korean FDI in the Russian Far East, it seems necessary to enhance South Korean FDI in energy and other sectors in which South Korea is poorly endowed back at home.

On the other hand, due to insufficient data availability, the study was forced to limit the number of observations by 18 (which is rather small to induce a robust statistical result) and use a quarterly dataset (which hinders to the inclusion of multiple control variables in a model). In this sense, when the time series of the datasets are enough accumulated, the follow-up study should be conducted again.

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About the authors:

Lee Han-Sol — PhD (Economics), Senior Lecturer, Department of Marketing, RUDN University; ORCID: 0000-0002-7846-2374; e-mail: li-kh@rudn.ru

Degtereva Ekaterina Andreevna — Dr. of Sc. (Economics), Professor, Department of Marketing, RUDN University; Deputy Head, Centre for Strategic Studies, Institute of World Military Economy and Strategy, HSE University; e-Library SPIN-code: 8539-8849; ORCID: 0000-0002-8752-5840; e-mail: degtereva-ea@rudn.ru

Chernikov Sergey Urievich — PhD (Economics), Associate Professor, Department of Marketing, RUDN University; e-Library SPIN-code: 6391-2343; ORCID: 0000-0001-7524-4438; e-mail: chernikov_syu@pfur.ru