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The role of governance and market openness on bilateral trade flows of South Korea with CEE and CIS countries

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Abstract

Employing an intercountry trade force (ITF) theory, this paper investigates bilateral trade between South Korea and 28 economies of Central Eastern Europe (CEE) and the Commonwealth of Independent States (CIS) based on balanced panel data for the period from 2011 to 2019. Free trade space (FTS) and gravity index (GI) turned out statistically significant and their coefficient signs are in line with the research hypothesis. Our model also confirms that bilateral trade volumes are highly enhanced by the quality institutions of CEE and CIS countries. The impact of their good governance becomes larger in relation to South Korea's exports to those countries. A level of market openness (measured by FDI ratio and WTO membership) does not facilitate bilateral trade volumes, in general. However, WTO membership turns out to be a significant and positive factor in promoting CEE and CIS countries' exports to South Korea. Therefore South Korea must strive to enhance the institutional quality of CEE and CIS countries to ease the process of customs clearance and the conclusion and enforcement of trade contracts, and reduce transaction costs. Liberalizing economies based on internationally acknowledged economic principles will continue to enhance CEE and CIS countries' exports to South Korea.

Keywords: trade policy, intercountry trade force, institutional quality, market openness.
JEL classification: F10, F13, F14.

1. Introduction

Amid economic turmoil during the COVID-19 pandemic, South Korea established a firm position in international trade with the country being ranked as the 7th exporter and the 9th importer in 2020 (WTO, 2021). However, South Korea

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is highly vulnerable to exogenous factors (e.g., the China–USA trade war) due to its highly skewed international trade structure with a few countries, for instance, China, Japan, the USA, and Vietnam. This has long been cited as an endemic problem in the South Korean economy. And it has led the country to introduce foreign policies to expand its global footprint by diversifying international networks for economic cooperation. In particular, South Korea, whose society still harbors anti-communism sentiments, known as the "red complex," due to the ongoing national division of North and South, has modified its antipathy towards post-communist economies. In 2017, the South Korean government established the New Northern Policy to widen partnerships mainly with former Soviet Union (FSU) countries and the Commonwealth of Independent States (CIS) (Lee et al., 2021).

In addition, South Korea has expanded the horizon for economic cooperation with some post-communist economies in Europe, namely, Central Eastern European countries, which accessed the European Union (EU), based on the EU–South Korea FTA, which has been applied since July 2011.[1] Since 2019, South Korea has negotiated an FTA with Russia, which will expand foreign economic partnerships not only with Russia but also with other member states of the Eurasian Economic Union (EAEU). Besides, South Korea is one of the largest economies in the world and a significant global supplier of high-tech goods. Trade development with this country is an important task for any developing economy among CEE and CIS countries.

However, although they have grown significantly, bilateral trade flows of South Korea with CEE and CIS countries have remained at a modest level compared to that in Asia. In particular, the growth in trade with Vietnam is impressive. From 2011 to 2020, the compound annual growth rate (CAGR) of South Korea's exports to Vietnam is 13.6%, while that of South Korea's imports from Vietnam is 15%. In 2020, South Korea's exports to Vietnam accounted for 9.5% of its total exports, and South Korea's imports from Vietnam accounted for 4.4% of its total imports. By contrast, over the past decade, South Korea's exports to CEE and CIS countries annually decreased by –0.5%, on average, and South Korea's imports from those countries annually increased only by 1.7%, on average. In 2020, South Korea's exports to those countries accounted for 5.3% of its total exports, and South Korea's imports from those countries accounted for 3.7% of its total imports (IMF, 2022).

In this respect, among various economic regions in the world, this paper especially aims to elucidate the idiosyncrasies of bilateral trade patterns of South Korea with CEE and CIS countries. It is worth noting that previous studies have explored the trade patterns of South Korea (Guilhot, 2010; Kang, 2014; Rasoulinezhad and Kang, 2016; Aw et al., 1998; Feenstra et al., 1999; Chiou-Wei and Zhu, 2002; Elsig and Dupont, 2012; Chiang, 2013; Lim and Breuer, 2019), but none of them tackled its trade patterns with CEE or CIS countries. Theoretically, this study provides new perspectives. Multiple previous studies applied gravity equations, but this study adopts a new trade theory, namely intercountry trade force (ITF) to lay out new empirical results and policy suggestions. Post-communist countries have dramatically modified their economic

[1] The sample countries in our study are given in Appendix Table A1. Among those countries, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia are member states of the European Union (EU).

and political institutions to adapt to new global environments. Thereby, along with the main factors of ITF theory, this study saw the institutions and market openness of CEE and CIS countries as key factors influencing their bilateral trade flows with South Korea, and a way to empirically measure their impacts on it. The results of the study can be used to formulate the directions of trade policy for South Korea, CEE, and CIS governments.

The remainder of this paper is organized as follows. In section 2, the trade structure between South Korea and CEE/CIS countries will be investigated. In section 3, we explore previous studies. Section 4 provides data and econometric models. Section 5 lays out the results of the empirical analysis. Section 6 compares our results with previous studies. Lastly, in section 7, we conclude with policy implications.

2. Trade structure between South Korea and CEE/CIS countries

Before conducting analyses in depth, in this section, the main trading partners of CEE/CIS countries with South Korea and their trade structure are investigated. Table 1 presents the five largest trading countries of CEE/CIS countries with South Korea. Both in terms of exports and imports, Russia is the largest trading partner of South Korea among 28 CEE/CIS countries in this study. In 2020, South Korea's exports to Russia amounted to $6.905 billion, while South Korea's imports from Russia amounted to $10.683 billion, which caused South Korea's trade deficit of $3.778 billion. Among CIS countries, besides Russia, Kazakhstan is the only outstanding trade partner of South Korea: it is the second largest importing country of South Korea among 28 CEE/CIS countries. South Korea's imports from Kazakhstan amounted to $1.089 billion in 2020, which is almost $^1/_{10}$ of that from Russia.

On the other hand, among CEE countries, 4 Visegrad Group countries are critical partners for South Korea both in exports and imports. South Korea's exports to Poland, Hungary, Czechia, and Slovakia ranked from 2nd to 5th, while South Korea's imports from Czechia, Slovakia, and Poland ranked from 3rd to 5th. In particular, South Korea's exports to Poland amounted to $5.640 billion, which is comparable to that of Russia. By contrast, South Korea's imports from Visegrad Group countries are at a similar level to that from Kazakhstan, but less than $^1/_{10}$ of that from Russia.

To probe the trade structure between South Korea and CEE countries, the greater volume of goods exported from South Korea to CEE countries is broken down

Table 1
Top 5 exporting and importing CEE/CIS countries with South Korea in 2020.

Rank	Exports[a)]		Imports[b)]	
	Country	Amount (million U.S. dollars)	Country	Amount (million U.S. dollars)
1	Russia	6,905.00	Russia	10,682.69
2	Poland	5,640.17	Kazakhstan	1,089.45
3	Hungary	2,922.52	Czechia	956.79
4	Czechia	2,693.70	Slovakia	872.85
5	Slovakia	2,210.92	Poland	832.68

[a)] Exports to the above five countries accounted for 75% of the total exports from South Korea to CEE/CIS countries.
[b)] Imports from the above five countries accounted for 83.8% of total imports from CEE/CIS countries to South Korea.
Source: IMF (2022).

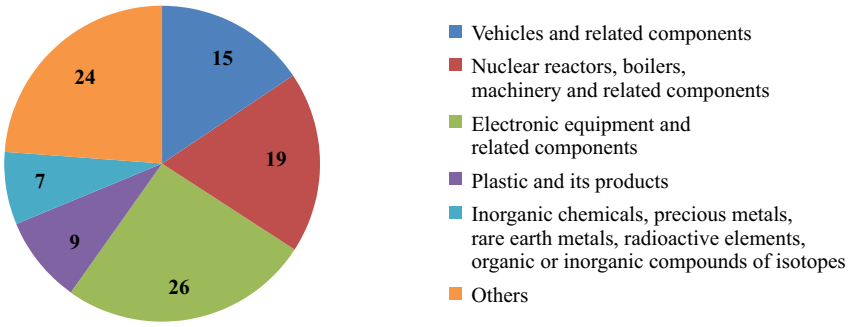

Fig. 1. The share of exported goods from South Korea to CEE countries in 2020 (%).
Source: Korea Customs Service (2022).

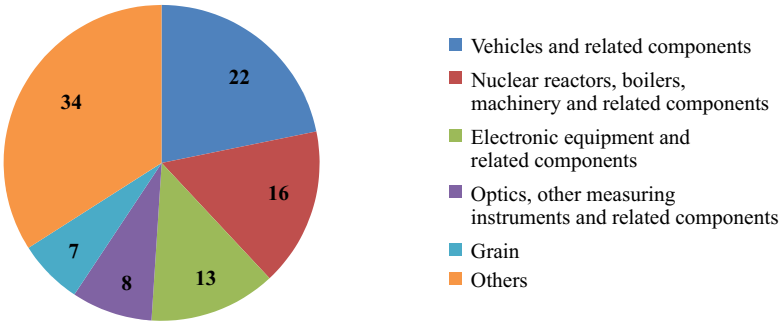

Fig. 2. The share of imported goods to South Korea from CEE countries in 2020 (%).
Source: Korea Customs Service (2022).

into electronic equipment and related components, nuclear reactors, boilers, machinery and related component, vehicles and related components, plastic and its products, and inorganic chemicals, precious metals, rare earth metals, radioactive elements, and organic or inorganic compounds of isotopes. And the greater volume of goods imported to South Korea from CEE countries is broken down into vehicles and related components, nuclear reactors, boilers, machinery and related component, electronic equipment and related components, optics, other measuring instruments and related components, and grain (Figs. 1–2). It is worth noting that trade between South Korea and CEE countries is much more active in intra-industries than inter-industries.

By contrast, South Korea's trade with CIS countries shows a rather different structure compared to that with CEE countries (Figs. 3–4). First of all, South Korea's substantial imports from Russia can be explained by looking at its import structure. Among all imported goods from Russia to South Korea, the import structure is highly distorted to one specific commodity: the import ratio of fuel was 74.1%. And this pattern is identically applied to imports from South Korea to Kazakhstan: fuel was the main product in imports and its imports ratio amounted to 70.5%. South Korea imports a small quantity of fuel additionally from three more CIS countries, namely Belarus, Kyrgyzstan, and Ukraine. In this sense, fuel accounted for 69% of the total imports of CIS countries to South Korea. In addition, it is worth noting that the main goods in trade between South Korea and

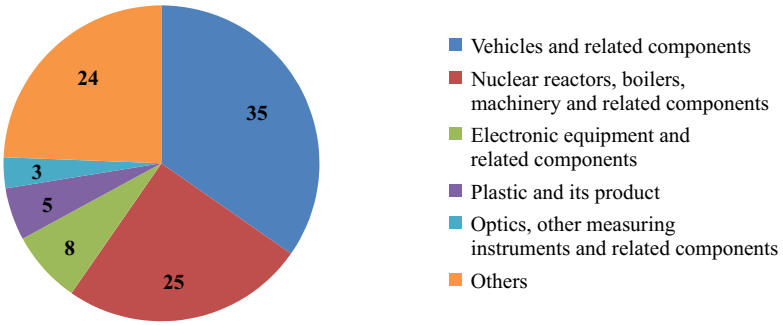

Fig. 3. The share of exported goods from South Korea to CIS countries in 2020 (%).
Source: Korea Customs Service (2022).

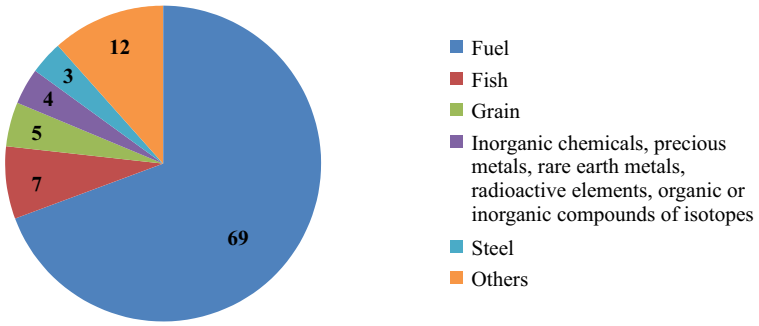

Fig. 4. The share of goods imported to South Korea from CIS countries in 2020 (%).
Source: Korea Customs Service (2022).

CIS countries do not overlap. From this, we can see that trade between South Korea and CIS countries is an inter-industrial structure. The inter-industrial trade structure between South Korea and Russia/Kazakhstan is attributed to natural resource abundant locational factors of these countries; however, this structure is rather commonly witnessed in other CIS countries (excluding Tajikistan[2]).

3. Literature review

3.1. The role of governance in trade

Governance is comprised of principles and institutions that exercise state authority (World Bank, 2021), and frequent studies have explored its significant role in trade. A study by Gani and Scrimgeour (2016) found that a better placement of democracy in Asian countries would increase the volume of exports coming from New Zealand. Bilgin et al. (2017) explored the effects of the nature of governance on exports. He managed to prove a positive correlation between the institutional quality of governance and the volume of exports. In particular, both employee and shareholder protections, which are related to the rigidness of the corporate

[2] The top imported goods from Tajikistan to South Korea were electronic devices and components, which accounted for 99.1% of the total.

system and regulation, are factors suppressing exports. Hasiner and Yu (2018) investigated how an exporter's institutional quality affects Chinese meat imports, and demonstrated a positive correlation between an exporter's institutional indicators and their meat exports to China. Álvarez et al. (2018) investigated the role of institutional quality and trade in 186 countries and demonstrated that better institutional quality in importing countries enhances trade. In a study by Heo et al. (2020) on trade between NAFTA and 105 partnering countries, a positive correlation between institutional quality and trade flows is revealed. Abreo et al. (2021) emphasized that the improvement of institutional quality significantly enhances foreign sales in Columbia.

Gupta et al. (2019), in their study based on datasets of 164 countries for the period 1985–2013, identified a particular negative association between the geopolitical risks (GPR) index and trade flows. Rasoulinezhad (2019) explored how the imposition of sanctions on Iran and Russia influences the choice of their trading partners and revealed that the trade patterns of these countries are Asianized and de-Europeanized under sanctions. In a study by Kumari and Bharti (2021), a positive association between trade and the quality of an institution is demonstrated.

Other papers, by contrast, show mixed results. A study by Méon and Sekkat (2007), examined three types of exports, namely total exports, exports of manufactured goods, and exports of non-manufactured goods, to gauge the effects of institutional quality on them. Institutional quality was revealed as positive and significant only in the case of the exports of manufactured goods. Tamaş and Miron (2021), in their study on Romania's exports to the 27 EU countries, demonstrated the great positive impacts of regulatory quality on their exports, while the effects of other governance indicators are mixed. A study by Bah et al. (2021) on exports of 45 sub-Saharan African countries, revealed that the total exports and exports of services are positively correlated with six governance indicators, while that of manufactured goods showed co-movement with those indicators excluding government effectiveness.

To conclude, good governance is a highly relevant factor to promote trade. By contrast, research on trade between South Korea and post-communist countries has seldom been conducted because it counts for less. In addition, previous studies predominantly employed a gravity equation, but we will apply a fresh and relatively unexplored trade theory: the intercountry trade force (ITF) model. In this sense, our study can provide new perspectives. The findings of the previous studies are illustrated in Table 2.

3.2. The degree of market openness and trade

In the modern economy, international economic activity plays an incredibly important role in the economy of enterprises because it provides many markets for their goods and services, allows access to more resources, and enhances efficiency in value chains. Since the establishment of the World Trade Organization (WTO) in 1995, the place of trade in the world economy has consistently increased. Since 1970, global exports have increased by 58.5 times. In 2020, despite harsh restrictions on cross-border activities of industrial enterprises due to the COVID-19 pandemic, the share of exports in global GDP was still considerable, by 26.47% (World Bank, 2022).

Table 2
Summary of previous studies on the relationship between trade and governance.

Study	Methodology	Country/Year	Findings
Méon and Sekkat (2007)	OLS, 2SLS	59 (57) countries (1990–2000)	Among total exports, exports of manufactured goods, and exports of non-manufactured goods, only exports of manufactured goods are positively correlated with institutional quality.
Gani and Scrimgeour (2016)	Cross-sectional estimation of pooled data, instrumental variable	Between New Zealand and Asia (2003–2012)	A negative relationship between Asia's political rights (ranging from 1 to 7, were 1 representing the highest degree of democracy, and 7 — the lowest degree) the highest with New Zealand's exports to Asia.
Bilgin et al. (2017)	Fixed effects (FE), random effects (RE)	166 countries (1976–2004)	Quality institutions promote exports.
Álvarez et al. (2018)	Poisson Pseudo-maximum likelihood (PPML)	186 countries (1996–2012)	Positive impacts of higher governance indicators of importing countries on their total trade volumes.
Hasiner and Yu (2018)	Fixed effects vector decomposition (FEVD)	Between China and the world (1990–2013)	Countries with better-quality institutions export more meats to China.
Gupta et al. (2019)	FE, RE, Hausman–Taylor (HT), PPML	164 countries (1985–2013)	A negative relationship between the geopolitical index (GPR) and trade flows.
Rasoulinezhad (2019)	FE, RE, FMOLS	Iran/Russia–Western European states / Asia-Pacific countries (2006–2015, 2008–2016)	Impacts of sanctions on modifying trading partners of Iran and Russia from Western European states to Asia-Pacific countries.
Heo et al. (2020)	System GMM	Between NAFTA and 105 countries (2006–2017)	A positive correlation between institutional quality and trade flows.
Kumari and Bharti (2021)	OLS, system GMM	160 countries (2012, 2015, 2017, 2019)	A positive impact of good governance on trade.
Tamaş and Miron (2021)	GLS	Between Romania and 27 EU countries (2007–2018)	The significant relationship between Romanian regulatory quality and their exports is demonstrated, while the impacts of other governance indicators are mixed.
Abreo et al. (2021)	PPML	Between Colombia and 136 countries (2005–2018)	A significant impact of the governance quality of Columbia and the institutional distance between the country and its partner on its exports.
Bah et al. (2021)	System GMM	45 sub-Saharan African countries (1996–2019)	Total exports and exports of services are positively correlated with six governance indicators, while that of manufactured goods showed co-movement with those indicators excluding government effectiveness.

Source: Compiled by the authors.

In addition, in the 21st century, multinational enterprises (MNEs) are actively developed. There are different views on the definition of MNEs, depending on their standardized classifications, but according to the United Nations (UN), MNE is defined, in a broad sense, as any company acting in more than one country by establishing foreign branches or affiliates (UN, 1973). One of the main indicators to estimate the development stage of MNEs is the volume of foreign direct investment (FDI). Global inward FDI stock has increased from $700 billion in 1980 to $41 trillion in 2020; and its ratio to global GDP reached 48.80% in 2020 from 6.19% in 1980 (World Bank, 2022; UNCTAD, 2022). These accumulative values of FDI show how much the internationalization of MNEs has actively progressed over the past four decades. Although, as a result of COVID-19, global FDI inflow temporarily fell by 35% in 2020, these consistent and considerable accumulated values of FDI indicate that the pattern of FDI will be normalized to a pre-pandemic level in the mid- and long-term taking into account the continuation of the underlying MNEs' macroeconomic motives of direct investment.

The post-communist countries have actively opened up their economies to increase exports, and implemented favorable policies to attract foreign investment. On the other hand, the relationship between trade and FDI is rather vague and controversial, although both are highly relevant indicators to measure the degree of market openness (Mundell, 1975; Kojima, 1975; Zhang and Felmingham, 2001; Head and Ries, 2004; Sultan, 2013; Limaye and Pednekar, 2019).

4. Data, model specification, and research hypothesis

Our study followed the intercountry trade force (ITF) model, which was introduced by Rasoulinezhad and Jabalameli (2019) and Rasoulinezhad et al. (2022). In this model, we can include distance as a time-variant factor by incorporating it with GDP factors, and those factors become one variable, known as the gravity index (*GI*). The formula of *GI* is as follows:

$$GI_{i,j,t} = \frac{GDP_{it} \cdot GDP_{jt}}{Distance}. \tag{1}$$

Another main factor of the ITF model is the free space of trade (*FST*) of country *i* with *j* and it can be formulated as follows:

$$FST_{i,j,t} = \frac{Trade_{j(w-i),t}}{Trade_{j,t}}. \tag{2}$$

The basic econometric model of ITF is formulated as follows:

$$Trade_{i,j,t} = \beta_0 + \beta_1 GI_{i,j,t} + \beta_2 FST_{i,j,t} + \beta_3 T + \varepsilon_{i,j,t}, \tag{3}$$

where *Trade* denotes trade flows between country *i* and *j* in year t; GI denotes gravity index; *FST* denotes free space for trade. A larger (smaller) FST stands for a less (higher) free space for trade (Rasoulinezhad and Jabalameli, 2019). The economic meaning of the *FST* is trade potential between country *i* and *j* in comparison to the world. Other variables affecting bilateral trade flows are included in *T*. Our study

Table 3
Summary statistics.

Variable	*N*	Mean	Std. dev	Min	Max	Unit
Trade	252	1.538883	3.972172	0.000962	25.79849	Billion U.S. dollars
Trade-to-Korean GDP ratio	252	0.001047	0.002721	6.48E–07	0.017562	Ratio
Export	252	0.923239	1.816322	0.000935	11.14910	Billion U.S. dollars
Import	252	0.615644	2.369631	1.42E–07	17.45812	Billion U.S. dollars
FST	252	0.988690	0.015924	0.898175	0.999714	Ratio
GI	252	48.69045	121.1626	0.988552	765.5177	$(\text{Billion})^2$ U.S. dollars/mile
Gov	252	–0.026347	0.704927	–1.431124	1.237206	–2.5 ~ +2.5
FDI	252	0.039504	0.033280	–0.116104	0.172481	Ratio
WTO	252	0.753968	0.431554	0.000000	1.000000	1 or 0

Source: Authors' calculations.

assumes that institutional quality and the degree of market openness of CEE and CIS countries are key factors in their trade with South Korea, alongside GI and FST.

For regression analysis, we constructed balanced panel datasets of 28 of South Korea's partner post-communist economies in CEE and CIS countries for the period 2011–2019. The list of the 28 South Korea's partner countries in this study is shown in Appendix Table A1. Table 3 presents summary statistics of dependent and independent variables in our study.

Fig. 5 represents the dynamics of panel data during 2011–2019. It is notable that trade, trade-to-Korean GDP, and exports fell to the bottom in 2016 and showed a growing tendency afterward. By contrast, South Korea's imports from CEE and CIS countries increased notably in 2014, but decreased markedly in 2016. Afterward, it showed a growing tendency again. FST peaked in 2017 and decreased afterward. GI is highly fluctuating. It has repeated increasing and decreasing tendencies. Governance indicators have consistently increased since 2015. The FDI-to-GDP ratio sharply decreased in 2013 and showed slow upward tendencies afterward.

The following four ITF models are applied in our study:[3]

$$Trade_{i,t} = \beta_0 + \beta_1 FST_{i,t} + \beta_2 GI_{i,t} + \beta_3 Gov_{i,t} + \beta_4 FDI_{i,t} + \\ + \beta_5 WTO_{i,t} + \varepsilon_{i,t}, \quad (4)$$

$$Trade\text{-}to\text{-}Korean\ GDP\ ratio_{i,t} = \beta_0 + \beta_1 FST_{i,t} + \beta_2 GI_{i,t} + \\ + \beta_3 Gov_{i,t} + \beta_4 FDI_{i,t} + \beta_5 WTO_{i,t} + \varepsilon_{i,t}, \quad (5)$$

$$Export_{i,t} = \beta_0 + \beta_1 FST_{i,t} + \beta_2 GI_{i,t} + \beta_3 Gov_{i,t} + \beta_4 FDI_{i,t} + \\ + \beta_5 WTO_{i,t} + \varepsilon_{i,t}, \quad (6)$$

$$Import_{i,t} = \beta_0 + \beta_1 FST_{i,t} + \beta_2 GI_{i,t} + \beta_3 Gov_{i,t} + \beta_4 FDI_{i,t} + \\ + \beta_5 WTO_{i,t} + \varepsilon_{i,t}, \quad (7)$$

[3] A variance inflation factor (VIF) test is carried out to clarify the issue of multicollinearity among selected explanatory variables in our study. As illustrated in Appendix Table A2, the VIF values of all the explanatory variables are below 2.5. A multicollinearity is not a crucial issue in our models.

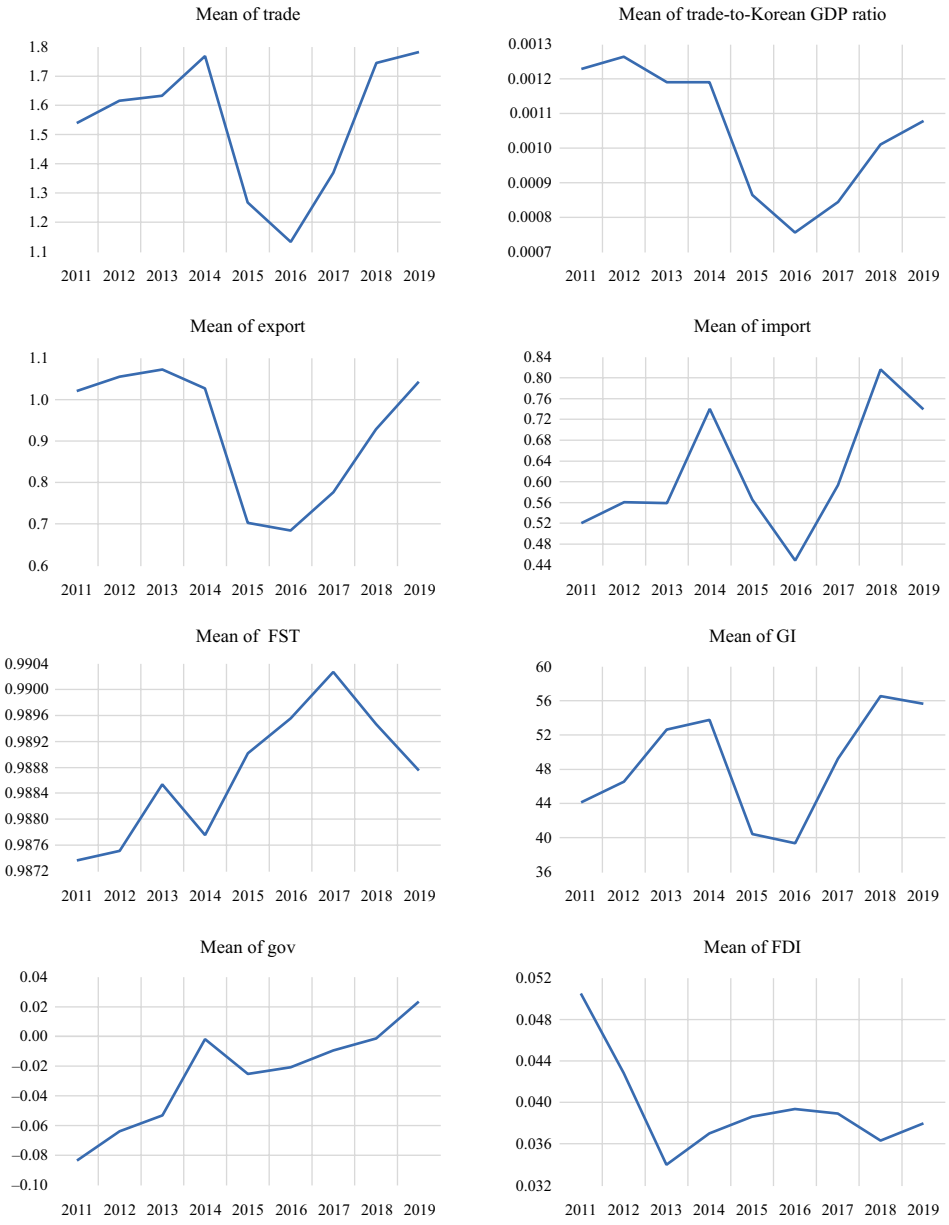

Fig. 5. Graphical representation of selected variables.

Source: Compiled by the authors.

To describe dependent variables, $Trade_{i,t}$ denotes bilateral trade volumes (the sum of exports and imports, current million U.S. dollars) between South Korea and country i in year t. $Trade\text{-}to\text{-}Korean\ GDP\ ratio_{i,t}$ is the ratio of trade volumes between South Korea and country i to South Korean GDP in year t. This ratio indicates the significance of trade with CEE and CIS countries to the South Korean economy. $Export_{i,t}$ is South Korea's exports to CEE and CIS countries, while $Import_{i,t}$ is South Korea's imports from CEE and CIS countries.

$FST_{i,t}$ is a free trade space between South Korea and country i in year t. $GI_{i,t}$ is a gravity index between South Korea and country i in year t. $Gov_{i,t}$ denotes an

Table 4
An expected sign of independent variables.

Variable	Expected sign
FST	Negative
GI	Positive
Gov	Positive
FDI	Positive
WTO	Positive

Source: Compiled by the authors.

average value of the World Bank's Worldwide Governance Indicator (WGI) in six criteria (scaled from –2.5 to +2.5) of the country *i* in year *t*, which are composed of control of corruption (CC), governance effectiveness (GE), political stability and absence of violence/terrorism (PV), regulatory quality (RQ), rule of law (RL) and voice and accountability (VA). A higher score stands for better governance. The inclusion of these six variables in a single regression model could give rise to an issue of multicollinearity (Moers, 1999), and to avoid this risk, in line with the previous studies of Al-Marhubi (2004) and Karimi and Heshmati Daiari (2018), an average of the six criteria is used in our study. The WGI was used to estimate institutional quality in multiple previous empirical studies (for instance, Berden et al., 2014; Martínez-Zarzoso and Márquez-Ramos, 2019; Khorana and Martínez-Zarzoso, 2020). $FDI_{i,t}$ is the FDI-to-country *i*'s GDP ratio in year *t*. The degree of FDI restrictions is an estimator of market liberalization, and the level of FDI inflows is influenced by business environments and policies of FDI host countries towards foreign companies (Banga, 2003; Ghosh et al., 2012). $WTO_{i,t}$ is a dummy variable (1 during the period after the accession to the WTO, and 0 otherwise) and denotes membership of the World Trade Organization (WTO) as another proxy to a level of market openness.

Table 4 presents the research hypothesis. A larger (smaller) FST stands for a less (higher) free space for trade (Rasoulinezhad and Jabalameli, 2019). The expected sign of FST is negative. If an economic size-to-distance ratio becomes larger, there are more market opportunities. The expected sign of GI is positive. Previously, multiple kinds of research have demonstrated a positive correlation between institutional quality with trade volumes (Bilgin et al., 2017; Hasiner and Yu, 2018; Gupta et al., 2019; Khorana and Martínez-Zarzoso, 2020). Good governance of a partner country in CEE and CIS will positively facilitate trade flows by allowing a flexible process of contracts, customs clearance, and others. Thereby, the expected sign of Gov is positive. In terms of post-communist economies, whose markets were closed for the world economy, the degree of market liberalization may be a significant determinant of increased trade volumes. FDI ratio and accession to the WTO are relevant indicators to measure the degree of their market openness. In this sense, the expected signs of FDI and WTO are positive.

5. Empirical results

For the empirical analysis, we used OLS, GLS (period SUR), FE, and RE estimators to obtain robust results. Table 5 summarizes empirical findings from

Table 5
Regression results 1.

Dependent variable	Trade				Trade-to-Korean GDP ratio			
	(1) OLS	(2) GLS	(2) FE	(4) RE	(5) OLS	(6) GLS	(7) FE	(8) RE
FST	–27.19563***	–26.96873***	–43.43721***	–41.43965***	–0.017605***	–0.016010***	–0.019874***	–0.021570***
	(3.274108)	(1.806231)	(5.415999)	(4.665964)	(0.002676)	(0.001224)	(0.005641)	(0.004480)
GI	0.031239***	0.030924***	0.033884***	0.032122***	2.13E–05***	2.11E–05***	2.29E–05***	2.15E–05***
	(0.000422)	(0.000392)	(0.001294)	(0.000858)	(3.45E–07)	(2.92E–07)	(1.35E–06)	(7.31E–07)
Gov	0.370652***	0.252759***	1.242375***	0.642111***	0.000270***	0.000186***	0.001138***	0.000421***
	(0.084508)	(0.073342)	(0.338304)	(0.178001)	(6.91E–05)	(5.39E–05)	(0.000352)	(0.000146)
FDI	–0.339797	–0.246120	–0.767896	0.006011	–0.000191	–0.000145	–0.001101	6.66E–05
	(1.517300)	(0.187674)	(1.143872)	(1.114870)	(0.001240)	(0.000132)	(0.001191)	(0.001190)
WTO	0.218358	0.180291***	0.042000	–0.032966	6.39E–05	8.03E–05**	–0.000305	–0.000347**
	(0.136126)	(0.045568)	(0.178006)	(0.160226)	(0.000111)	(3.41E–05)	(0.000185)	(0.000161)
Constant	26.76446***	26.59328***	42.86639***	40.98735***	0.017382***	0.015808***	0.019883***	0.021596***
	(3.217698)	(1.791928)	(5.372351)	(4.623451)	(0.002630)	(0.001216)	(0.005595)	(0.004433)
Country	No	No	Yes	Yes	No	No	Yes	Yes
Year	No	No	Yes	Yes	No	No	Yes	Yes
R-squared	0.964403	0.964199	0.991793	0.863792	0.949348	0.958352	0.981034	0.794532
N	252	252	252	252	252	252	252	252

Note: Standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.
Source: Authors' calculations.

Table 6
Regression results 2.

Dependent variable	Export				Import			
	(9) OLS	(10) GLS	(11) FE	(12) RE	(13) OLS	(14) GLS	(15) FE	(16) RE
FST	–28.22476***	–23.01696***	–22.44953***	–25.11311***	1.029136	–2.871477***	–20.98768***	–12.52022***
	(2.994849)	(2.239011)	(5.127314)	(4.475375)	(2.802097)	(1.094069)	(5.849970)	(4.525984)
GI	0.012582***	0.013080***	0.019664***	0.015503***	0.018657***	0.017910***	0.014221***	0.017103***
	(0.000386)	(0.000456)	(0.001225)	(0.000805)	(0.000361)	(0.000281)	(0.001397)	(0.000746)
Gov	0.573953***	0.346773***	0.701340**	0.645609***	–0.203302***	–0.066961	0.541035	–0.100821
	(0.077300)	(0.063152)	(0.320271)	(0.165517)	(0.072325)	(0.068049)	(0.365411)	(0.149302)
FDI	–1.339974	–0.312664	0.331383	0.763323	1.000177	0.304006*	–1.099279	–0.628699
	(1.387885)	(0.291695)	(1.082901)	(1.086529)	(1.298559)	(0.178005)	(1.235527)	(1.188658)
WTO	–0.080949	–0.030347	–0.321437*	–0.425780***	0.299307**	0.149845***	0.363437*	0.407627**
	(0.124515)	(0.059479)	(0.168518)	(0.154772)	(0.116501)	(0.040281)	(0.192269)	(0.161776)
Constant	28.34525***	23.03849***	22.40918***	25.30536	–1.580793	2.554056**	20.45721***	11.87634***
	(2.943251)	(2.226366)	(5.085993)	(4.433794)	(2.753820)	(1.082325)	(5.802825)	(4.479951)
Country	No	No	Yes	Yes	No	No	Yes	Yes
Year	No	No	Yes	Yes	No	No	Yes	Yes
R-squared	0.857555	0.829462	0.964822	0.635868	0.926737	0.953864	0.973096	0.705599
N	252	252	252	252	252	252	252	252

Note: Standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.
Source: Authors' calculations.

models using Eq. (4) and Eq. (5), while Table 6 illustrates that from models using Eq. (6) and Eq. (7). In line with a theoretical hypothesis, in general, FST is negatively correlated with Trade, while GI is positively correlated with it.

As expected, the results yield a positive coefficient of Gov on bilateral trade, suggesting that the enhancement of governance indicators in CEE and CIS countries helps to increase trade flows with South Korea. Their positive statistical significance survives throughout the model (1)–(8). The results are valid when the dependent variable is changed by South Korea's exports to the CEE and CIS countries (see model (9)–(12)). However, the significant and positive effect of Gov disappears when the dependent variable is South Korea's imports from the CEE and CIS countries (see model (13)–(16)).

Contrary to the research hypothesis, FDI does not present a statistical significance throughout the model (1)–(8), while the coefficient sign of WTO is rather vague, which indicates that the degree of market openness does not have a positive and significant impact on trade volumes between South Korea and CEE and CIS countries. The same results are repeated, when a dependent variable is South Korea's exports to CEE and CIS countries (see model (8)–(12)). However, the significance of WTO consistently appears, when the dependent variable is South Korea's imports from the CEE and CIS countries (see model (13)–(16)).

6. Discussion

First of all, our study found an inverse relationship between FST and trade, which is in line with the theoretical hypothesis, but contradicts the previous studies of Rasoulinezhad and Jabalameli (2019) and Rasoulinezhad et al. (2022). The CEE and CIS countries need to enhance a free space of trade, which is equivalent to trade potential, with South Korea. Second, GI turned out positive and significant, which is in line with previous studies (Rasoulinezhad and Jabalameli, 2019; Rasoulinezhad et al., 2022). It indicates that economic sizes relative to distance are crucial to increase trade flows. The economic growth of South Korea, CEE, and CIS countries is critical to promote bilateral trade volumes. Thirdly, Gov presented a positive and significant coefficient to enhance bilateral trade flows, in general. In a plethora of studies, the significance of governance indicators has been proven (see Table 1). This indicates that improving the institutional quality of CEE and CIS countries positively facilitates trade flows with South Korea. However, it also turned out that the positive impacts of institutional quality of CEE and CIS countries are much more relevant to increase South Korea's exports to those countries. In our results, the positive significance of institutional quality disappeared, when the dependent variable was changed by imports. This indicates that the enhancement of the institutional quality of CEE and CIS countries is a much more important agenda for the South Korean government considering its close association with their export volumes to those countries.

However, contrary to predictions, FDI is defined as an insignificant factor in trade. First of all, the FDI-to-GDP ratio of CEE and CIS countries does not have any impact on their bilateral trade with South Korea. Although the trade creation effects of FDI have been amply demonstrated in empirical studies (Brainard, 1997; Liu et al., 2001; Tadesse and Ryan, 2002; Marchant et al., 2002), traditional theory

has long posited a substitutable relation of FDI and trade in that FDI is induced to overcome trade restrictions of a host country (Mundell, 1957; Wakasugi, 1994; Caves, 1996). In addition, in a study by Pontes (2006), a dualistic relationship (both complements and substitutes) between FDI and trade is empirically proved.

In our empirical study, the effect of WTO is rather vague, and although WTO membership likely plays a crucial role before concluding preferential trade agreements (PTAs), its impacts become relatively insignificant after PTAs come into effect (Rose, 2004). Nowadays, membership of WTO is relatively weak as the impacts of PTAs become larger. However, it is interesting to note that WTO membership is a significant factor for CEE and CIS countries. Although it does not have a significant impact on bilateral trade or South Korea's exports, its impact becomes significant on their exports to South Korea. It indicates that WTO membership of the CEE and CIS countries is still a crucial factor in greatly facilitating South Korea's imports from those countries.

7. Concluding remarks

This study explores the idiosyncrasies of bilateral trade patterns between South Korea and 28 post-communist economies in CEE and CIS for the period from 2011 to 2019 by employing the ITF model. The effects of governance indicators and a level of market access are especially explored in addition to the initial variables of ITF (namely, FST and GI).

Our findings are in line with the theoretical hypothesis of the ITF model. The coefficient of FST turned out negative, while that of GI showed positive. CEE and CIS countries need to enhance a free space of trade and trade potential with South Korea. Also, an increase in economic mass relative to distance will significantly facilitate trade flows. This indicates that enhancing economic conditions in line with the geographical distance to each country is critical in order to also enhance trade volumes between South Korea and CEE/CIS countries.

In addition, we find that the high institutional quality of CEE and CIS countries generates a positive impact on bilateral trade flows with South Korea, which is in line with previous studies (Bilgin et al., 2017; Álvarez et al., 2018; Heo et al., 2020; Kumari and Bharti, 2021). In particular, good governance of CEE and CIS countries highly facilitates South Korea's exports to those countries, while it does not have a significant impact on South Korea's imports from those countries. This indicates that raising the governance quality of CEE and CIS countries can boost overseas sales from South Korea to those countries. CEE and CIS countries, for their part, used their WTO membership to enhance their exports to South Korea.

From the above results, we can induce policy implications as follows. Improving the institutional mechanisms of CEE and CIS countries is highly relevant to enhance trade flows with South Korea. Particularly, it is a much more important agenda for South Korea in that good governance of CEE and CIS countries positively facilitates its exports to those countries. In this vein, it seems necessary for South Korea to strive to enhance the institutional quality of CEE and CIS countries to ease the process of customs clearance and in order to conclude and enforce trade contracts and reduce transaction costs. South Korea should construct a joint committee with CEE and CIS countries, and hold regular

meetings to share desirable directions of institutional reformation regarding the bilateral trade process. Further economic integration through, for instance, trade agreements can be considered based on developed institutional systems of CEE and CIS countries. In addition, to increase their exports to South Korea, it seems necessary for CEE and CIS countries to access global trading systems and equip themselves to negotiate them properly. They should also open their borders by following the principles of global trading standards. Those economies that succeed in liberalizing themselves based on internationally acknowledged economic principles will enhance their exports to South Korea. It is important to provide comprehensive institutional support for bilateral foreign economic relations between South Korea and CEE/CIS countries, relying on the best international practices as a concretization of the general principle of openness of the economies as a whole.

Also, it is necessary to take into account the historical and geopolitical features of each of the countries. This is especially significant for the macroeconomic and geopolitical situation in 2022, during a period of fundamental changes in world trade and increasing conflict in politics. Despite all the upheavals of 2022, South Korea's overall strategy, and its foreign economic policy towards the CEE/CIS countries, are generally characterized by pragmatism. These features of South Korea make it possible to maintain and, even, in a number of commodity groups, increase foreign economic turnover with the CEE/CIS countries.

On the other hand, this study does have limitations. Although the study categorized countries as CEE and CIS countries and composed a panel, some countries, like Russia, have particular and unique trade patterns and characteristics as demonstrated in Section 2 of this study. Therefore, in a follow-up study, it is recommended to sophisticate the trade patterns with a specific country of CEE and CIS, which has dominant trade volumes with South Korea, and include other important variables, for instance, oil prices, exchange rate volatility, and so forth.

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Appendix

Table A1
List of South Korea's partner countries in the study.

CEE (16 countries)	CIS (12 countries)
Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, North Macedonia, Montenegro, Poland, Romania, Serbia, Slovak Republic, Slovenia	Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyz Republic, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan

Note: Not only current member states but also the previous member states of CIS are included for this study.
Source: Compiled by the authors.

Table A2
Multicollinearity test.

FST	GI	Gov	FDI	WTO
1.190602	1.146535	1.554364	1.116784	1.511531

Source: Compiled by the authors.