Does Institutional Quality Matter to Korean Outward FDI? A Gravity Model Analysis

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I. Introduction

According to Korea's Ministry of Knowledge Economy (currently the Ministry of Trade, Industry and Energy), foreign investment has now become one of the major economic pillars driving the Korean economy over the past 15 years (Tang 2022). The Korean economy started to open up to rest of the world following the Asian financial crisis in 1997 and was the biggest FDI policy reformer among 40 developed and emerging economies over the period from 1997 to 2010 (Nicolas et al. 2013). Over the last decade, Korea's outward FDI grew much faster than inward FDI (See Figure 1) and Korea is now a net capital exporter to the world. In 2021, Korea's outward FDI flows totaled $76.64 billion and a total of 2323 Korean enterprises invested in overseas countries (Korea EXIM Bank 2022). Due to this increased amount of outward FDI, a large number of studies (Kim and Rhee 2009; Park and Jung 2020) investigated what determines Korea's outward FDI (OFDI).

Institutional quality is found to be a major determinant in FDI literature in general. It suggests that political risk (lack of/poor institutional quality) not only deters FDI inflows to host countries but also can lead FDI to countries with higher risks and to 'pollution heaven' which might have an adverse impact on long term growth and development in both host and home countries. There are strong empirical evidences in literature that lack of institutional quality or good governance is associated with lower FDI inflows. An extensive literature (Alfaro et al. 2008; Ali et al. 2010; Akhtaruzzaman et al. 2017; Bénassy-Quéré et al.

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2007) investigated FDI response to various types of institutional quality in FDI host countries. Over the last 20 years data evidenced that Korea's OFDI flowed to developing countries with a sustained large gap existing in institutional quality between host countries and Korea (See, Fig 2 top panel); however; those countries had been offering a higher degree of capital account openness. A sharp increase in capital account openness since the early 2000s coincides with sharp increase in Korea's OFDI to those host countries. For example, Peru was the least open economy and started to initiate measures to open capital account since the mid-90s and early 2000s. The degree of openness in Peru is now similar to that of developed countries. On the other hand, Peru is one of the least progressed countries in terms of institutional quality over the same period of time. This slow or no progress in institutional quality is a common pattern of institutional improvement for a large sample of host countries

of Korea's OFDI (see, Figure 2). However, those developing countries including Peru are regular destinations of a substantial amount of Korea's OFDI. Does this suggest that institutional quality of host country does not matter to Korean investors, or is there a 3rd factor mitigating the impact of institutional quality on Korea's OFDI? Few studies on Korea's OFDI considered institutional quality of host country as a control variable instead of main determinant of FDI (Park and Jung 2020). However, existing studies do not explain why Korea's OFDI flowed to countries with a large gap in institutional quality between Korea and host countries. This research fills the gap in the literature of Korea's OFDI. The findings of this research suggest that high degree of capital account openness (a factor that ensures profit repatriation of investors) weakened the negative impact of poor institutional quality in host countries on Korea's OFDI.[1]

Figure 1. FDI Inflow and Outflow of Korea
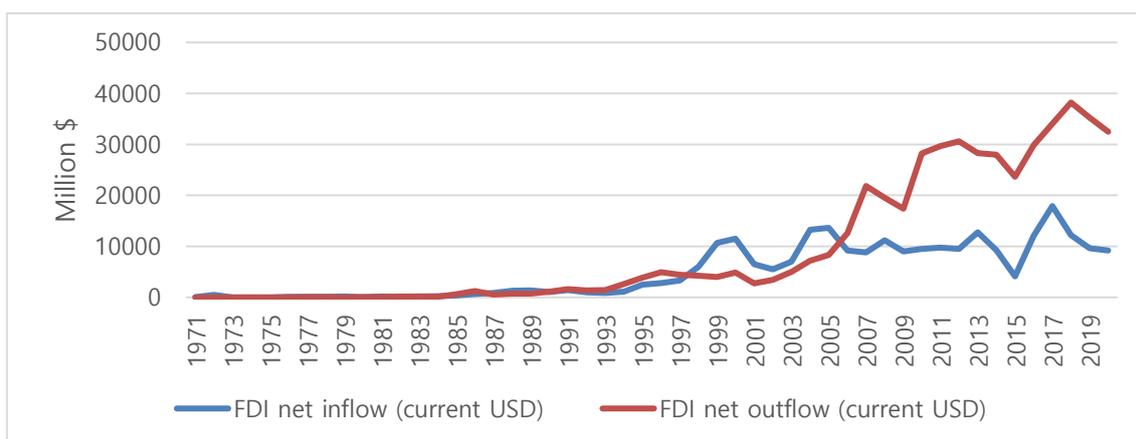
Source: WDI 2022.

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[1] The term institutional quality and governance are used synonymously in this research. Poor institutional quality or lack of good governance indicates higher level of political risk of a country.

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**Figure 2. Governance Gap between Korea and Host (Top Panel),
Capital Account Openness and Governance in Host (Bottom Panel)**
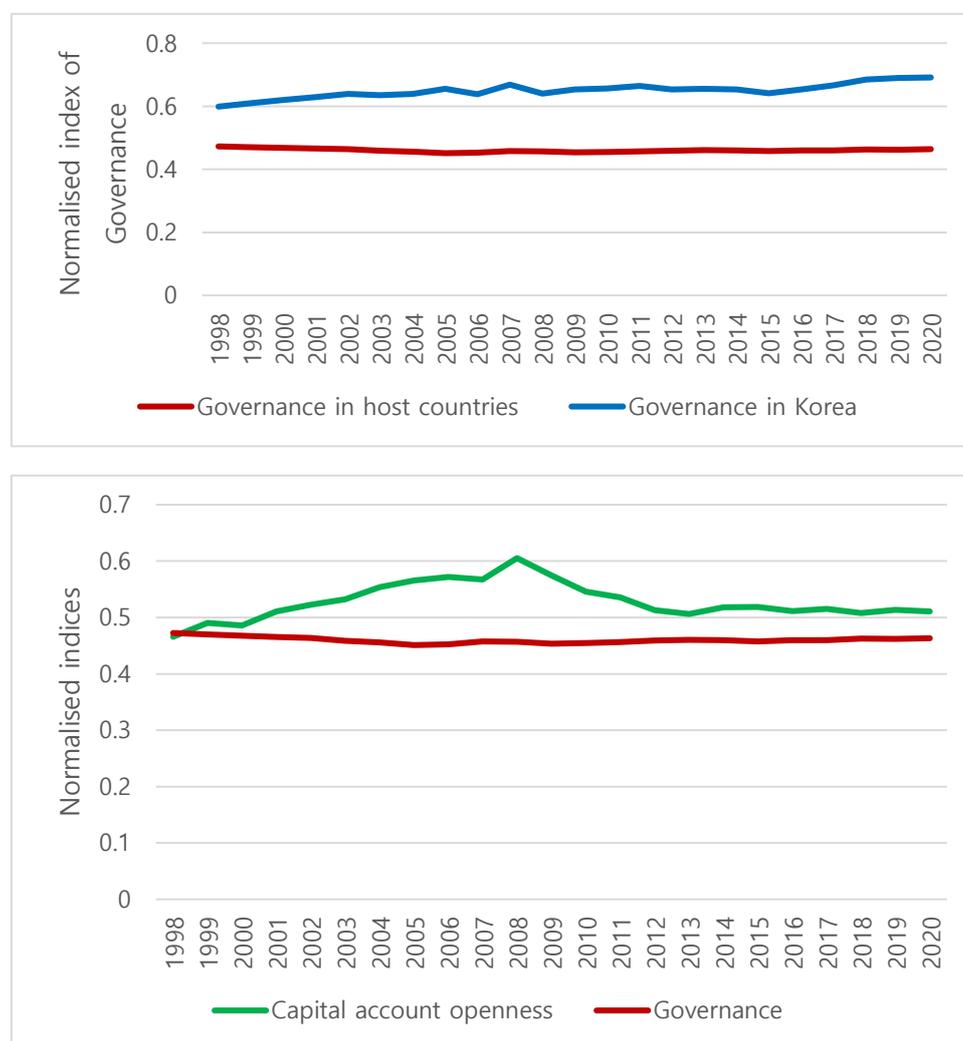
The remaining of this paper is organised as follows. Section II reviews relevant literature of FDI and identifies major determinants for Korea's OFDI from existing studies; Section III discusses research method and empirical issues; Section IV presents the research findings; Section V concludes the research, points to the research limitations, and provides policy recommendations.

II. Literature Review

1. Institutional Quality, Capital Account Openness, and FDI

Empirical literature on FDI found that institutional quality has both direct and indirect effects on FDI and plays an important role in shaping the geography of global FDI flows. Alfaro et al. (2008) argue that differences in institutional quality determine FDI inflows

and can fully account for the Lucas paradox (a paradox of why capital tends not to flow from rich to poor countries as predicted by standard neoclassical theory). Different studies used different variables to measure institutional quality; for example, rule of law from WGI was used as a measure of institutional quality for Chinese outward FDI (Kolstad and Wiig 2009). Hyun and Kim (2010) analysed cross-border mergers and acquisitions (M&A) data of a panel of 101 countries (both developed and developing) and found that stable institution (measured by law and order) and higher financial openness are significant determinants of inward M&A from developed to developing countries. Akhtaruzzaman et al. (2017) showed that impact of the expropriation risk (an abrupt and total loss of foreign investment occurs due to lack of property rights and in the absence of institutional strength in host countries) is substantially larger than any other types of institutional risk (e.g., corruption, political stability).

Capital account openness in host country also plays an important role in determining FDI inflows due to the fact that repatriating investment profit to headquarter is a global nature of such investment in order to support other subsidiaries or to make investment in a new location. Prior to the 1990s, capital account openness was largely confined by the high-income OECD countries and many non-OECD countries started to liberalise capital account during the post-1990s as evidenced in the Chinn-Ito index (2006) data. The positive impact of capital account openness on growth is stronger in

countries with strong institutions (Arteta et al. 2001). Consistent to this argument, FDI literature suggests that higher degree of capital account openness attracts higher FDI and also there is a link between FDI, capital account openness and institutions. Conversely, capital control deters FDI and the impact varies across regions and by the exchange rate regimes (Asiedu and Lien 2004). Capital account openness promotes FDI inflows only if the institutional quality is better in the capital-recipient country (Noy and Vu 2007). Other studies found that capital account openness has positive impact on FDI if a country has passed a certain threshold of institutional quality or reduced political risk and depends on political stability (Gammoudi and Cherif 2015). Prior studies (Busse et al. 2010) found a link exists between bilateral investment treaties (BIT) and FDI via institutional quality of the host country. They argue that BITs mitigate the negative impact of poor institutional quality on FDI. In sum, there is evidence in existing literature that institutional quality and capital account openness are important determinants of FDI and there is an interrelationship between them.

2. Factors Affecting Korea's OFDI

Buckley et al. (2022) examined the link between Korea's FDI location decisions and Korea's merchandise exports and imports and found evidence that Korea's FDI decisions vary by trade destinations and unit values of trade goods. Bulus and Koc (2021) examined whether the pollution heaven hypothesis

(PHH) is supported by the inward FDI in Korea from 1970-2018 and found the relationship between per capita GDP and CO_2 emissions is N-shaped.

Li et al. (2021) examined the impact of Korea's trade and FDI on total green factor productivity (TGFP) in Chinese provinces and cities, as China is the top recipient of Korea's OFDI. They found evidence that FDI is inhabiting Chinese TGFP, which supports the 'pollution heaven hypotheses' of Korea's OFDI.

Korean outward FDI searches for locations with lax environmental regulation and seeking for 'pollution heaven' (Chung 2014). Seo and Suh (2006) examined trade impact on Korean outward FDI and found that FDI stock does not have trade substitution effects on Korea's trade, however contemporaneous FDI flows have marginal effect on Korea's export. Another study suggests that wage increase of high-wage workers with 3-5 years of work experience have negative impact on Korea's outward FDI and wage increase of low-wage workers with less experience have positive impact on Korea's FDI in the Asian developing countries (Ryu and Jeong 2020). A mixed method research conducted for Korea's outward FDI into Vietnam, which suggests that Korea's OFDI decision is influenced by low wages, trade openness, government policy and tax incentive, supports that Korea's FDI is guided by the efficiency-seeking motive (Ta et al. 2020). Park and Jung (2020) examined impact of bilateral investment treaties (BITs), diplomacy, and foreign aid on Korea's OFDI

and found that BITs and foreign aid have statistically significant impact and diplomacy (presidential visit) has significant impact on non-Asian (predominantly African) developing countries. Lee et al. (2021) examined 174 Korean enterprises investing in the developed and emerging markets to understand how OFDI impact home country knowledge transfer and innovation and found that OFDI have unequal impact on home country innovation.

In sum, the findings of the existing studies on Korea's OFDI suggest that OFDI is motivated by risk diversification, cost advantage, and market access seeking (Moon 2007; Ryu and Jeong 2020); bilateral investment treaties, official aid, and diplomacy with recipient countries (Park and Jung 2020); home (Korea) country innovation effects (Lee et al. 2021); merchandise trade (Buckley et al. 2022; Seo and Suh 2006); lax environmental regulation in recipient countries (Chung 2014); technological intensity, strategic assets (Kim and Rhee 2009); and natural resources seeking (Fung et al. 2009).

III. Methodology

1. Empirical Model

The empirical model is based on gravity framework, as such in Park and Jung (2020); however, main variables of interest of this research are institutional quality (Govern) and capital account openness (Kaopen) of host countries, added to gravity model variables (GDP, distances) along with other commonly

used controls (GDP per capita, exports, population), see Equation (1). The aim of this empirical model is to examine the impact of institutional quality on Korea's outward FDI and how this relationship is influenced by the degree of capital account openness in host countries. For this purpose, an interaction term between institutional quality and capital account openness is included in the model, similar to Noy and Vu (2007). A negative and statistically significant interaction term would suggest a higher level of Kaopen mitigates negative impact of poor institutional quality of the FDI host country and increases FDI inflows despite the country's poor institutional quality. A positive interaction term would suggest a higher degree of Kaopen brings higher FDI if host country institutional quality is better.

$$lnOFDI_{it} = \alpha_0 + \beta_1 Govern_{it} + \beta_2 Kaopen_{it}$$

$$+\beta_3 Govern_{it} * Kaopen_{it} + \beta_4 GDP_{ijt}$$

$$+\beta_5 Dist_{it} + X_{it} + u_{it} \quad \text{--------------(1)}$$

where i refers to host countries, $i = 1, 2,…, N$, and t refers to T time points, $t = 1, 2,…, T$. $OFDI_{it}$ it is the amount of South Korea's outward FDI flows to a host country, $Govern_{it}$ is the institutional quality in host countries, $Kaopen_{it}$ is the capital account liberalization in host countries, GDP_{ijt} is the gross domestic product in Korea and in host countries, $Dist_{it}$ is the distance between capital cities of

Korea and host countries, X_{it} set of controls in host countries (GDP per capita, Korea's export to host countries, population in host countries). A sample of 45 non-developed countries data from 1997-2020 was considered for this empirical analysis.[2] Please find details of the data in Appendix 1 and the sample of countries in Appendix 2.

2. Estimation Issues

Pooled OLS method was used to generate base model results, not reported, however, as it has many drawbacks in panel data, such as cross-sectional dependence that affects the standard errors.[3] In the presence of cross-sectional dependency and omitted variables bias inconsistencies are amplified. Panel regression model is better to deal with these issues and can capture cross-sectional variations and time variance impacts in the data. Random effect model is more appropriate for this panel data as the empirical model is based on gravity model and geographic distance is considered an important determinant of FDI. Therefore, the chosen estimation method is RE where variation across cross-sections is assumed to be random and uncorrelated with the predictor variable. There are possibilities that differences across FDI recipient countries influence Korea's OFDI but they are uncorrelated with the predictor variables in the model, which

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[2] The term non-developed was chosen carefully to select a sample of countries that not only includes developing countries but also countries from other groups (transition countries, middle-income and high- income countries) and excludes the developed countries. The rationale of this sample choice is based on literature that suggests institutional quality is not

only a developing country concern but also can be an issue in transition economies, middle or high-income countries.

[3] Pooled OLS results are consistent to the panel RE model results and even stronger in the sense that most of the model estimates were found to be statistically significant.

also suggests for RE model. One of such differences is geographic distance between host countries and Korea, which is likely to influence OFDI from Korea however unlikely to influence the degree of capital account openness in host counties. Moreover, the Breusch Pagan test was conducted to decide between RE and OLS and RE was preferred over OLS.

IV. Results and Findings

Table 1 shows the descriptive statistics of the variables used in the empirical analysis. Table 2 is estimation results of the Equation (1) using random effects (RE) model. Model 1 is for gravity variables and the main variables of interest of this research (Govern, Kaopen, and interaction between them), Model 2 adds other controls to Model 1, Models 3-8 are same as

Model 2 but examine different aspects of governance or institutional quality. Institutional quality is found to be a positive and statistically significant determinant of Korea's OFDI. More specifically, governance index (average of six aspects of governance) and specific aspects of governance in host countries – control of corruption, rule of law, and political stability – are statistically significant determinants of Korea's OFDI. Korean investors prefer host countries with higher degree of capital account openness over countries less open. The main variable of interest of this research is the interaction effect variable (interaction between capital account openness and governance) which is found to be negative and statistically significant in most of the cases of the estimated Models (1, 2, 3, 6, 7) in Table 2.

Table 1. Summary Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
Log Korea's outward FDI	855	3.84	2.48	0.00	9.37
Governance index	855	0.45	0.13	0.15	0.83
Corruption control	855	0.44	0.16	0.17	0.97
Gov effectiveness	855	0.49	0.15	0.18	0.99
Political stability	855	0.42	0.16	0.00	0.82
Rule of law	855	0.45	0.15	0.15	0.88
Regulatory quality	855	0.49	0.16	0.03	0.95
Voice and accountability	855	0.42	0.15	0.05	0.76
Capital account openness	855	0.53	0.35	0.00	1.00
Log GDP host	855	25.17	1.86	19.12	30.29
Log GDP Korea	855	27.70	0.39	26.67	28.18
Distance	855	8.79	0.68	6.86	9.82
Log GDP per capita	855	8.33	1.17	5.56	11.23
Log exports	855	6.75	2.07	1.49	12.00
Log population	855	17.10	1.68	10.96	21.07

Table 2. Random Effect (RE) model. Dependent Variable is Log Korea's OFDI

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Governance index	5.836***	6.607***	5.941***	2.877	2.281*	6.290***	2.990	2.091
	(2.244)	(2.196)	(2.114)	(2.264)	(1.335)	(1.952)	(1.887)	(1.718)
Capital account openness (KAOPEN)	3.588***	2.765**	2.888***	1.913	1.007	3.153***	2.455**	1.484
	(1.228)	(1.197)	(0.932)	(1.252)	(1.161)	(1.053)	(1.042)	(1.041)
KAOPEN* Governance index	-5.831**	-4.837**						
	(2.491)	(2.467)						
KAOPEN* Corruption control			-5.072***					
			(1.842)					
KAOPEN* Government effectiveness				-2.488				
				(2.417)				
KAOPEN* Political stability					-0.773			
					(2.390)			
KAOPEN* Rule of law						-5.834***		
						(2.254)		
KAOPEN* Regulatory quality							-3.521*	
							(2.021)	
KAOPEN* Voice and accountability								-1.685
								(2.472)
Log GDP host	0.839***	-0.018	-0.018	-0.024	-0.049	-0.066	-0.033	-0.048
	(0.199)	(0.500)	(0.505)	(0.549)	(0.499)	(0.510)	(0.536)	(0.539)
Log GDP Korea	0.586	-0.200	-0.399	-0.070	-0.247	-0.153	0.019	-0.044
	(0.363)	(4.384)	(4.358)	(4.386)	(4.383)	(4.356)	(4.371)	(4.368)
Log Distance	-1.591***	-0.905***	-0.912***	-0.793***	-0.700***	-0.878***	-0.861***	-0.894***
	(0.299)	(0.277)	(0.277)	(0.277)	(0.243)	(0.284)	(0.265)	(0.267)
Log GDP per capita		-0.227	-0.184	-0.099	-0.069	-0.096	-0.051	0.010
		(0.508)	(0.543)	(0.614)	(0.518)	(0.555)	(0.530)	(0.569)
Log Export		0.669***	0.668***	0.673***	0.694***	0.663***	0.680***	0.687***
		(0.150)	(0.149)	(0.153)	(0.145)	(0.143)	(0.149)	(0.148)
Log population		0.255	0.245	0.237	0.332	0.276	0.255	0.286
		(0.528)	(0.537)	(0.578)	(0.534)	(0.538)	(0.568)	(0.578)
Constant	-22.458***	8.216	14.064	4.404	7.583	6.660	1.927	3.784
	(7.399)	(123.429)	(122.602)	(123.635)	(123.290)	(122.634)	(123.215)	(122.962)
Observations	855	855	855	855	855	855	855	855
# Countries	45	45	45	45	45	45	45	45

*** $p<0.01$, ** $p<0.05$, * $p<0.1$. Notes: Time fixed effects were controlled in each model. Standard errors are in parenthesis and adjusted for clusters of countries which corrects for autocorrelation. Gov index is the average of six dimensions of governance. Model 1-2 for governance index, Model 3-8 for different aspects of governance.

A negative and significant interaction effect suggests that Korea's OFDI flowed to countries with higher degree of capital account openness and with poor institutional quality. In other words, Korean investors might have considered that despite poor institutional quality these countries are attractive locations for investment because they offer high degree of flexibility of repatriation of investment profits. Top recipients of Korea's OFDI are China, Vietnam, Brazil, Indonesia, and Malaysia. Among the top recipients, the degree of capital account openness (i.e., ease of capital movement) is high except China. For example, Vietnam moved from a stricter capital control with a Chinn-Ito openness index value of 0.16 to relatively open capital account with Chinn-Ito index value of 0. 42 since 2008. These top FDI recipient countries are included in this research sample. It is also observed that more than half of the observations (429) of the entire sample investigated in this study had Chinn-Ito capital account openness index value (0.84) at or above the 3rd quartile.[4] It suggests that higher degree of capital account openness was a pull factor for Korea's OFDI, which might have mitigated the institutional risk of investment in those countries. The negative and statistically significant coefficient of interaction term thus explains why Korean investors chose host countries despite lower levels of institutional quality. Korea's export to host countries is found to be a powerful predictor of Korea's OFDI, as also evidenced in existing studies (Buckley et al. 2022). Clearly, distance matters to Korean investors and Korean FDI is more likely to flow to neighbouring countries.

To check the sensitivity of the results due to sample observation, the sample observation (855) was kept constant across the estimated models (Model 1-Model 8). The residual density plot (against Kernel density plot), not reported, confirms that the normality assumption was valid for estimated models. The issue of serial correlation is less concerning due to the panel structure used in the estimation has larger N (45) and smaller T (23) and robust (clustered) standard errors were used.

V. Conclusion and Implications

This study investigated a sample of 45 countries from 1997-2020 that received significant amount of Korean OFDI and employed a panel RE model to understand why Korean FDI flowed to countries with a large gap in institutional quality between Korea and host countries. The findings suggest that high degree of capital account openness (a factor that ensures profit repatriation of Korean investors) of host countries mitigates the negative impact of poor institutional quality of host countries. This finding potentially explains why Korea's OFDI flowed to the countries with large gap in institutional quality. Merchandise trade (Korea's export) is found to be also a strong determinant of OFDI and distance between Korea and host country matters to Korean investors.

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[4] Capital account openness is measured by the Chinn-Ito (2006) index and rescaled to 0 (closed) to 1 (fully open).

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The implication of this research is that institutional quality has to be adequately analysed by Korean investors when considering to invest in developing countries. The mitigating effect of capital account openness on institutional quality needs to be examined carefully to avoid possible future investment risks which may result from poor institutional quality. Destination of Korean exports is a strong signal to Korean investors as a prospective destination of Korea's OFDI.

A limitation of this research was to find a bigger sample of FDI hosts that meet the criteria of non-developed countries and receive significant amount of Korea's OFDI regularly, and also the data for institutional quality and capital account openness available, which limits the sample size to 45 countries. For the robustness measure of institutional quality, alternative measures such as the PRS Group's ICRG data can be used; however, the PRS data are not publicly available. The number of Korean entrepreneurs investing overseas can be used as an alternative to total OFDI and a panel Poisson regression model can be used. The findings of this research can help future research using firm-level FDI data to understand firm-level decision making of Korean investors.**KIEP**

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Appendix 1: Data, Definition, Sources

Variable	Description	Source
lnFDI	Log of Korea's outward Foreign Direct Investment (current USD)	EXIM Bank of Korea (1997-2021)
Governance	The World Bank's *Worldwide Governance Indicators* used as a measure of institutional quality or governance condition in a host country. The WGI has six dimensions: control of corruption, government effectiveness, political stability and absence of violence, rule of law and voice and accountability. Governance index is the average of six dimensions of WGI. Original scales of WGI of -2.5 to +2.5 are rescaled to 0 (least developed governance) to 1 (most developed governance).	World Bank's WGI index (1997-2020)
Kaopen	The Chinn-Ito index is a measure for country's degree of capital account openness. Kaopen is based on the binary dummy variables that codify the tabulation of restrictions on cross-border financial transactions reported in the IMF's AREAER. Normalized (0-1) Chinn-Ito index (ka_open) was used in this research.	Chinn-Ito (2006). Data from 1997-2021
lnGDP	Log of gross domestic products of host countries and source country (current USD)	**World Bank's WDI data base: 1997-2021**
lnDist	Log of distance between capital cities of Korea and host countries.	**CEPII's database**
lnX:	Log of (GDP per capita, population, and Korea's exports) to host countries	**World Bank's WDI data base: 1997-2021**

Appendix 2: Country Sample (45 Non-Developed Countries)

Bangladesh, Bolivia, Brazil, Cambodia, Chile, China, Colombia, Egypt, El Salvador, Ghana, Guatemala, Honduras, Hong Kong, India, Indonesia, Israel, Jordan, Kazakhstan, Kyrgyz, Laos, Madagascar, Malaysia, Marshall Islands, Mauritius, Mexico, Mongolia, Morocco, Myanmar, Nepal, Nicaragua, Oman, Pakistan, Panama, Papua New Guinea, Peru, Philippines, Russia, Saudi Arabia, Singapore, South Africa, Thailand, Turkey, U.A.E, Uzbekistan, Vietnam