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Threshold Values of Institutional Quality on FDI Inflows: Evidence from Developing Economies

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Abstract

Purpose: This study estimates the threshold values of institutional quality through investigating the non-linear effect of six sub-indices of Worldwide Governance Indicators on FDI inflows in 34 developing countries in Asia and Eastern Europe over the period from 2000-2017. **Research Design, data and methodology**: GMM EGLS is employed which does not include the lagged value of the dependent variable as an independent variable. As a proxy for the institutional quality, either one of the six sub-indices of WGI from World Bank or the composite index obtained through a principal component analysis is used in a separate model. **Results:** An improvement in institutional quality, when the quality stays below a certain threshold level, does not increase FDI inflows, and only when the quality is above the threshold, it can positively influence FDI inflows. The threshold values of political stability and absence of violence, government effectiveness, and rule of law are relatively higher than those of the other dimensions of WGI. **Conclusion**: Institutional quality of the developing economies of Asia and Eastern Europe has a non-linear effect on FDI inflows. The target countries need to upgrade their institutional quality above the threshold in order to attract more FDIs.

Keywords: Developing Countries, FDI Inflows, Institutional Quality, Non-linear Effect, Threshold Values

JEL Classification Code: C33, F21, F23, M31

1. Introduction

Numerous researches support the positive role of FDI (foreign direct investment) inflows in promoting economic growth in the host countries (Sarker & Khan, 2020). The positive relationship between FDI inflows and economic growth is found in contribution of FDI inflows to capital formation, technology transfer, creating jobs and development of international market networks (Ghazalian & Amponsem, 2019).

These positive functions of FDI inflows have consequently led to fierce competition among national or regional governments to attract FDI (Harding & Javorcik, 2011). They competitively adopted FDI-promoting policies such as tax breaks, subsidies, and other benefits, and tried to improve the business environment to be more favorable for foreign investors over the last few decades (Lee, Park, & Namgung, 2019).

Multinational Enterprises (MNEs)' investment in foreign countries are triggered by several motives such as: market seeking, efficiency seeking, natural resource seeking, and strategic asset seeking (Dunning, 1993). To be the beneficiaries of the investments, many national or regional governments try to tailor themselves to the motives of FDI. Although constraints or confinement of market size and natural resources make the efforts of governments futile in market or resource seeking FDIs, lots of things can be done by governments including making policies to facilitate foreign investments into the host country, making the business environment more favorable for foreign investors,

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and improving the general quality of the institutions of their countries to attract efficiency seeking FDIs. Especially when the quality of institutions other than any other factors of a host country is suspected to discourage foreign investments into the country, a significant improvement of it through government efforts can send a positive signal to foreign firms so that they undertake FDIs hoping to establish a smooth relationship with the local governments without incurring any extra hidden costs frequently arising in the countries with low quality institutions. Improvement in the institutional quality can lead to cost reduction of MNEs operating in the host countries. For example, swift handling of duties or administrative procedures by government officials results in cost savings of enterprises, while strict government regulations and corruption may increase the cost of businesses. Therefore, improvement in the institutional quality, in general, is likely to have positive impact on MNEs' FDI activities in the host country, which will consequently be linked to attracting more FDI inflows into the country.

On the other hand, in a host country where the institutional quality is very low, MNEs may have to cope with numerous challenges facing them in the course of business operations there due to lack of systemic and well-organized institutions. They may even have to deal with the government officials to win a favor for their businesses. In a more serious case, foreign firms may suffer a huge amount of capital loss when it intends to withdraw its investment from the host country due to undesirable economic forecasts, even though once awful political risks such as expropriation and confiscation seldom occur these days. For these reasons, firms tend to be reluctant to enter foreign countries with poor institutional qualities.

Therefore, improvement in the quality of the institutions in a host country will, as mentioned above, be highly related to attracting FDI inflows, thus contributing to the economic growth of the country. As most prior studies suggest, there is a linear positive effect of institutional quality on FDI inflow (Aziz, 2018; Globerman & Shapiro, 2002). However, if the country's institutions have very low quality, that is, below a certain threshold point, a slight improvement may not provide any effective influence on attracting the investments. From this insight, I assume the relationship may not be linear, but rather non-linear unlike what most studies have shown. More specifically put, in developing countries with very poor contract undertaking, property right protection and so on, a slight improvement of the institutions may not possibly contribute to encouraging FDI inflows because it may not seem to be a fundamental change or a break-through improvement of the countries' institutions which have long been considered bad customs or corrupt practices deterring MNEs' intention to do business there.

Yet, few researches have shed light on the nonlinear relationship between the two variables of my interest.

To fill the gap in literature, this study estimates the threshold values of institutional quality through investigating the non-linear effect of six sub-indices of Worldwide Governance Indicators on FDI inflows in 34 developing countries in Asia and Eastern Europe using GMM EGLS including the square term of institutional quality. FDI inflows to the target countries have been on the rise despite the world trend of decline since 2015. Donaubauer and Dreger (2016) even argue these countries have replaced China as production bases since a multitude of MNEs have already left China to look for cheaper labor due to its ever rising labor cost. All these attributes of the sample are considered to suffice for the purpose of my analysis.

The study can contribute to government policies as well as academia in the following aspects. Firstly, this study tries to confirm the nonlinear relationship between institutional quality and FDI inflows, while most studies examine it linearly except for Kurul (2017). If, as I assume, the relationship is non-linear where there is a certain point of threshold which inverts the relationship into increasing FDI inflows, this study can provide practical implications for governments striving to attract more FDIs. This study is basically in line with Kurul, but the difference is that while she used only the composite index obtained through the principal component analysis using the six sub-indices of Worldwide Governance Indicators as an institutional quality variable without estimating each threshold value of the six sub-indices, this study focused on calculating each threshold value of the six dimensions of WGI by using each of the six sub-indices respectively in a separate model.

The study is structured as follows: Section 2 provides a literature review on the relationship between institutional quality and FDI inflows, and Section 3 develops the empirical model and discusses the econometric methodology. Empirical results are presented and discussed in Section 4, and Section 5 presents conclusion and implications.

2. Literature Review

A growing amount of attention has been paid to the role of institutional quality as a factor in determining FDI inflows since the early 1990s. Daniele and Marani (2006) explain three channels through which institutions may affect inward FDI. First, factor productivity can increase in good institutional environments, which in turn attracts foreign investments. Second, transaction costs related to investment, especially when related to corruption, can also be reduced in good institutions. Finally, reliable legal environment can be

provided in good institutions that guarantee intellectual property right as well as general property rights which MNEs value in conducting their FDI activities usually involving high sunk costs.

In fact, a number of empirical researches have been conducted on the relationship between the institutional quality and FDI inflows, and most have found that there is a linear and positive relationship (e.g. Aziz, 2018; Ghazalian & Amponsem, 2019; Marson & Nor, 2013). However, some studies (e.g. Kurul & Yalta, 2017; Nondo, Kahsai, & Hailu, 2016) have shown that there are no significant relationships, and some others (Feulefack & Ngassam, 2020; Kolstad & Wang, 2012) have even found negative relationships. Most of these studies, notwithstanding the varied results, focus on the linear relationship between the two variables.

However, one can reasonably assume that the relationship between the variables is non-linear (Zangina & Hassan, 2020). Although it is necessary to perform this kind of researches exploring the non-linear relationship between the institutional quality and FDI inflows, few studies, so far, have focused on this topic except for Kurul (2017) which investigates the non-linearity of the two variables upon the subject of 126 developing countries from 2002 to 2012.

Recently, Wang, Padmanabhan, and Huang (2020), and Zangina and Hassan (2020) argue that corruption, a measure of institutional quality, affects FDI inflows nonlinearly. In particular, as Wang et al. (2020) identify after examining the relationship with annual data from developing countries over the 2002-2015 period, improvement in the level of corruption in developing countries with a relatively low level of corruption increases FDI inflows, whereas that in developing countries with a relatively high level of corruption rather decreases FDI inflows. Zangina and Hassan (2020) also explore how corruption influences foreign investment in Nigeria during the period from 1984 to 2017. They reveal the asymmetric relationship between the two variables. This means that improvement in corruption encourages FDI inflows to the country, whereas deterioration in corruption is insignificant.

Likewise, Craigwell and Wright (2011) suggest that corruption has a nonlinear effect on FDI inflows in 4 countries among 42 developing economies of their target over the period from 1998 to 2009. The reason this nonlinear relationship appears between corruption and FDI inflows, as identified above, can be that when corruption level is very high, a little improvement of it, not fundamental one, may rather increase the time and money foreign firms should spend in relation to their business activities. According to Bardhan (1997), in countries with a high level of corruption, it can rather serve as grease or lubricating oil by which MNEs can overcome or smooth unjust interventions or regulations of the governments of the host countries. Therefore, a slight improvement in corruption, not complete one, reduces the role of corrupt government officials as lubrication oil MNEs can take advantage of in operating their businesses in host countries with low quality levels of institutions, and rather increases the hidden costs for them thus deterring FDI inflows in general.

By the way, the different results of preceding studies as shown far above indicate that the relationship of my interest may not be conclusive. This, I assume, is partially attributable to the measurement of the institutional quality. Even the same studies sometimes produce different results depending on the measurements of institutional quality. As measures of institutional quality, the most frequently used ones are Worldwide Governance Indicators from World Bank and Economic Freedom Index from Heritage Foundation or Fraser Institute among others.

For example, Worldwide Governance Indicators are employed as a measure of institutional quality in Marson and Nor (2013), Nondo, Kahsai, and Hailu (2016), Feulefack and Ngassam (2020), and Sabir, Rafique, and Abbas (2019). On the other hand, Kostevc, Redek, and Sušjan (2007), and Tintin (2013) uses Economic Freedom Index from Heritage Foundation, whereas Ghazalian and Amponsem (2019) adopt Economic Freedom Index from both Heritage Foundation and Fraser Institute. Aziz (2018) uses both Economic Freedom index from Fraser Institute and Ease of Doing Business Index from World Bank.

This study is unique in that it analyzes whether the institutional quality has a nonlinear effect on FDI inflows using 6 sub-indices of WGI and estimates the threshold value of each sub-index.

3. Methodology and Data

My empirical model is devised based on the eclectic paradigm (Dunning, 1998) and the institutional economics theory (Kostova & Hult, 2016). The eclectic paradigm provides that location advantage perspective is closely related to determining which countries are best suited for specific types of FDI, depending on economic rationale the countries may provide including the relative costs and benefits of the host countries (Dunning, 2001). Four primary motives for FDI are identified by the eclectic theory such as market seeking, efficiency seeking, natural resource seeking, and strategic assets seeking (Dunning, 1993). These motivations are incorporated into my empirical model except for strategic asset seeking motive because my target countries do not seem to possess strategic assets like advanced technologies.

However, eclectic paradigm framework has often been criticized for its lack of dynamism and its excessive emphasis on economic efficiency. Thus, it, alone, may not fully explain why MNEs choose certain locations.

Incorporating the institutional approach into this theory can better depict the phenomenon (Kang, 2018).

3.1. Variables and Data

This study employs panel data of 34 developing countries from Asia and Eastern Europe (See Appendix) over the period 2000–2017 to analyze the relationship between institutional quality and FDI inflows. But, since unbalanced panel data are used due to missing observations for some years and some countries, the empirical results must be interpreted or understood with special care.

Like in many prior studies (Dorozynski, Dobrowoska, & Kuna-Marszatek, 2020; Marson & Nor, 2013; Wang & Li, 2018), net FDI inflows as a percentage of GDP is used as the dependent variable. The adoption of FDI/GDP as the dependent variable is intended to control the effect of larger amount of FDI inflows in countries with larger GDP. Data source comes from World Bank's World Development Indicators (2019).

For the purpose of capturing the overall institutional quality of the target countries, this study considers both the six measurements of World Bank's Worldwide Governance Indicators (2018) such as voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, and control of corruption and an aggregate or composite index obtained through a principal_component analysis using the six sub-indices of WGI. PCA is a non-parametric and multivariate technique that can extract relevant information from a large dataset where observations are generally depicted with several correlated quantitative variables (Islam, Khan, Sroka, & Olah, 2020).

It also employs the square term of the institutional variable. The square term of institutional quality allows us to capture the non-linear relationship (Almodovar & Rugman, 2014; Benito-Osorio, Colino, & Gurrras-Martin, 2016; Kaulihowa & Adiasi, 2019). However, since the score often appears as a negative number, the square value of it becomes the same as that of an initially positive level variable. To prevent this problem and make each of the linear variable have a positive value, I add 3 to each original value. Besides, the six dimensions are so highly correlated with each other that any combined use of them in a single equation may cause multi-collinearity concern. One might possibly infer, for example, that a better accountability system leads to less corruption, or that respect for rule of law results in less abuse of public officials for private gain (Kaufman, Kraay, & Mastuzzi, 2010). Thus, each of the six measurements and the aggregate index is used respectively in a separate model.

There is an extensive body of literature that has sought to identify the main variables that may affect FDI inflow. Based on the prior studies, I incorporate twelve control variables. To investigate the motivation for market seeking FDI, I consider economic growth rate, GDP, and surrounding market potential, whereas for efficiency seeking FDI, I regard inflation, labor force supply, export orientation, infrastructure, financial development, capital market openness, ICT environment, and relative wage. For natural resource seeking FDI, I use natural resource variable. Table 1 shows definition of variables and data sources.

3.2. Analysis Method

This study establishes multiple regression models on unbalanced panel data as the empirical tools for estimating the effect of institutional quality on FDI inflows.

A pooled regression is carried out as my baseline analysis. However, this pooled regression may result in biased estimates or inefficient estimators due to the potential endogeneity of FDI inflows and some of the explanatory variables such as institutional quality variables. Since the use of lagged values of explanatory variables cannot solve the endogenous problem completely, I determine to use GMM (general method of moments), a preferred estimator, to correct this problem. Recent studies frequently resort to GMM which uses instrumental variables (Dorozynski et al., 2020; Sabir et al., 2019).

Here, I use GMM EGLS which does not include, as an independent variable, the lagged value of the dependent variable, as Buchanan, Le, and Rishi (2012) and Kang (2018) did. EGLS(Estimated Generalized Least Squares) method is used to control heteroskedasticity and auto-correlation problems. I do not employ system GMM because system GMM is designed for a situation with small T and large N panels, namely, with a short time period and many individuals (Roodman, 2009). Since my panels consist of 18 year time period and 34 individuals, system GMM is considered inappropriate for this study.

As for the instrument variables, I use the second lagged values of all the independent variables. The validity of the instrument variables is checked by using the J-statistics of over-identifying restrictions which examines whether my set of instrument variables, as a group, are exogenous (Ibrahim, Adam, & Sare, 2019).

I establish three different models.

Model 1 includes only control variables without incorporating any institutional variable.

Model 2 draws on model 1 and incorporates the linear term of institutional variable into control variables to examine the linear relationship between the institutional quality and FDI inflows.

Table 1: Definition of Variables and Data Sources

Variables	Definition	Source
FDI	FDI inflows as a percentage of GDP	World Development Indicators
Institution	VA, PS, GE, RQ, RL, CC and the composite index	World Development Indicators Authors' own calculation
Institution^2	The square term of the institutional variable	Worldwide Governance Indicators
GDP Growth	The growth rate of real GDP	World Development Indicators
GDP	The logarithmic value of GDP (constant 2010 USD)	World Development Indicators
Surrounding Market Potential	The distance-weighted average real GDP of all other countries in the world except for the host country	World Development Indicators Authors' own calculation
Inflation	Consumer price index (annual percentage)	World Development Indicators
Labor Force Supply	15-64 population (percentage of total population)	World Development Indicators
Export Orientation	Exports as a percentage of GDP	World Development Indicators
Infrastructure	Gross fixed capital formation as a percentage of GDP	World Development Indicators
Financial Development	Domestic credit to private sector as a percentage of GDP	World Development Indicators
Capital Market Openness	Chinn & Ito index of capital account openness	Chinn & Ito Database
ICT Environment	Mobile cellular subscriptions per 100 people	World Development Indicators
Relative Labor Cost	The ratio of GDP per labor in developing countries in Asia and Eastern Europe to the GDP in China	World Development Indicators Authors' own calculation
Natural Resources	Exports of oil, minerals, and metals as a percentage of total exports	UNCTAD

Note: VA is voice and accountability, PS is political stability and absence of violence, GE is government effectiveness, RQ is regulatory quality, RL is rule of law, CC is control of corruption.

Model 3 builds on model 2 by incorporating the square term of institutional variable allows to capture the non-linear relationship.

$$
\begin{aligned}
&FDI_{it} \\
&= \beta_0 + \beta_1 Institution_{it-1} + \beta_2 Institution_{it-1}{}^2 \\
&+ \beta_3 Economic\ Growth_{it-1} + \beta_4 GDP_{it-1} \\
&+ \beta_5 Surrounding\ Market\ Potential_{it-1} \\
&+ \beta_6 Inflation_{it-1} + \beta_7 Labor\ Force\ Supply_{it-1} \\
&+ \beta_8 Export\ Orientation_{it-1} \\
&+ \beta_9 Infrastructure_{it-1} \\
&+ \beta_{10} Financial\ Development_{it-1} \\
&+ \beta_{11} Capital\ Market\ Openness_{it-1} \\
&+ \beta_{12} ICT\ Environment_{it-1} \\
&+ \beta_{13} Relative\ Labor\ Cost_{it-1} \\
&+ \beta_{14} Natural\ Resources_{it-1} + \varepsilon_{it}
\end{aligned}
$$

4. Results and Discussion

4.1. Generating the Principal Component through Principal Component Analysis

To calculate the composite index, I conduct a principal component analysis on six measures of institutional quality indicators represented as scores in the original dataset. From the calculation of eigenvalue, I find that the first component among the six components has eigenvalue 4.7702, which alone is capable of explaining 79.5% of the variation, while the other components have eigenvalues lower than 0.7.

The minimum value of the score of the composite index calculated from the principal component analysis is – 4.101. Thus, to make the values positive, I add 5 to the original value of the composite index for regression. Since the equations include the square term of institutional quality variable, the linear term of it must be positive.

4.2. The Results of Regression

In order to detect the potential multicollinearity, I assess the variance inflation factor (VIF). VIF values for all the independent variables except for the linear term of institutional variable in model 3 are below the cutting-point, indicating the multicollinearity is not a concern for the data (Kang, 2018). The high VIFs caused by inclusion of square term of the institutional variable may not raise the concern for multicollinearity (Allison, 2012).

Table 2 reports the results of pooled regression and GMM for the aggregate index. model 1 examines only the effects of the control variables on FDI inflows. The linear term of institutional quality is introduced in model 2. model 3 incorporates the quadratic term of institutional quality to model 2.

Both the pooled regression and GMM show similar results, but GMM proves to have a higher R-squared and more significant variables than the pooled regression in all the models. J-statistics appear to support the null hypothesis of over-identifying restriction. Adjusted R-squared values are 0.35 or higher in all the GMM models, indicating that they have more than 35% of explanatory power of FDI inflows. Not so high level of explanatory power of the models can be attributed to the unavailability of the data of such explanatory variables as the quality level of labor and tax rate.

In both pooled regression and GMM, model 2 which includes the linear term of institutional quality shows a higher adjusted R-squared value than Model 1 where only control variables are included. This means that inclusion of an institutional quality variable as an independent variable better explains FDI inflows. Besides, model 3 which incorporates the quadratic term of an institutional quality variable into model 2 shows a higher adjusted R-squared value than model 2. This verifies that a non-linear model explains FDI inflows better than a linear model does.

In addition, while the institutional variable proves to be insignificant in model 2, the linear term and square term of an institutional variable in Model 3 appear to have significant coefficients at the 1% level. All these results allow us to conclude that it is a non-linear shape that better depicts the relationship between institutional quality and FDI inflows. In other words, below the threshold level of the institutional quality, an improvement of it may not have significant impact on FDI inflows, and only above the threshold level, an improvement of it can positively affect FDI inflows.

Table 3 shows the result of GMM analysis on the model that uses each of the 6 measurements of WGI. Table 3 shows significantly positive coefficients for the square terms of all respective institutional quality variables at the 1% or the 5% significance level, which is the same as the result of Table 2 where the composite index is used.

Economic growth shows significantly positive coefficients in all the models. It seems that high GDP growth stimulates and attracts FDI inflows by indicating the economic vitalities and market growth potential of the host countries. Both GDP and surrounding market potential show negative coefficients at either the 1% or the 5% level in most models. These results confirm that MNEs value the market growth potential, not the current market size of the host countries or the countries nearby.

Labor force supply shows a significantly positive coefficient at the 1% level in all the models. A high percentage of this working age population reflects a rich supply of labor, which seems to attract efficiency seeking FDIs. Export orientation shows a significantly positive coefficient at the 1% level in all the models. In general, countries with high export orientation are expected to have simplified procedures and well-equipped support measures for exports. Infrastructure shows a significant and positive coefficient at the 5% level in most models, which means that infrastructure of a host country also encourages FDI inflows. Financial development shows a negative and significant coefficient in some models, while in other models showing a negative but insignificant coefficient. This may be because MNEs do not consider the financial market status of the host countries when they select their investment locations since the development level of financial industry is very low in most target countries. Capital market openness shows a significantly positive coefficient in only a few models, but insignificant in most models. This may also be because the capital markets of the target countries are underdeveloped.

The ICT environment shows a significantly positive coefficient at the 1% or the 5% level in most models. Relative labor cost shows a significantly negative coefficient in most cases of model 3, meaning that the lower labor cost of the target country compared to that of China can attract FDIs into the host country. Results of GMM model 3 of Table 2 show the coefficient of the relative labor cost appears to be -0.165 when an aggregate index score is used as a proxy for institutional quality. That is, a 1% decline of relative labor cost means 0.165% increase of FDI per GDP to the target country. Considering that model 3 best explains FDI inflows in this study, I can possibly infer that labor cost is an important factor in MNEs' location choice for their FDI activities particularly motivated to seek efficiency. I can also confirm that, due to the rise in China's labor cost, my subject countries from Asia and Eastern Europe with relatively low labor costs have replaced China as production bases.

Natural resources variable shows a positive and significant coefficient in most models. It means that MNEs investing in the target countries value the presence of natural resources in the host countries.

Table 4 presents each threshold value of the 6 measures of the institutional quality, which is calculated with the coefficients of a linear and a square term of the six measures of the institutional quality variable obtained from GMM results of model 3 in Table 3. I obtain the threshold value by dividing the coefficient of the linear term by two times that of the square term, which finally appears as a negative value (Clapham & Nicholson, 2013).

The threshold appears to vary depending on the measure of institutional variable. The threshold values for voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, and control of corruption appear to be -0.20, 0.78, 0.02, -0.57, 0.04, and -0.14, respectively. As presented above, comparatively high threshold value of political stability and absence of violence indicates that foreign investors are sensitive to political stability because they may suffer from substantial losses caused by political instability such as coups and violent political strife. As of 2017, 5 to 26 countries of my target show their institutional quality levels higher than the threshold value depending on what indicator is used among the six sub-indices of institutional quality. Countries whose values for at least 3 of 6 dimensions of WGI are higher than the threshold value as of 2017 are Singapore, Slovenia, Slovakia, Poland, Hungary, Brunei Darussalam, Estonia, India, Indonesia, Sri Lanka, North Macedonia, and Malaysia.

Table 2: Regression Results for the Aggregate Institutional Quality Index

	Pooled Regression			**GMM**		
	Model 1	**Model 2**	**Model 3**	**Model 1**	**Model 2**	**Model 3**
Institution		-0.3448 (-1.2619)	-2.5080* (-1.8022)		0.1030 (0.6670)	-1.5824** (-2.4706)
Institution^2			0.2502*** (3.8499)			0.1455*** (4.4056)
Economic Growth	0.1832*** (2.7085)	0.2194*** (3.1122)	0.2038*** (2.9237)	0.3239*** (3.5199)	0.4699*** (3.8678)	0.4376*** (3.9189)
GDP	-0.8377** (-2.0302)	-0.7761* (-1.7360)	-0.7492* (-1.6975)	-0.8543*** (-5.9858)	-1.0074*** (-4.9913)	-0.8776*** (-4.7466)
Surrounding Market Potential	1.3785 (0.3816)	-7.7119* (-1.8773)	-16.209*** (-3.5109)	2.5127** (2.0023)	-2.5879 (-1.5553)	-8.3334*** (-4.2309)
Inflation	-0.0345 (-0.9687)	-0.0384 (-0.9932)	-0.0510 (-1.3312)	-0.0363 (-1.4393)	-0.0216 (-0.6689)	-0.0278 (-0.7332)
Labor Force Supply	0.2800*** (3.9813)	0.1925** (2.451)	0.1885** (2.4306)	0.2262*** (6.2384)	0.1433*** (4.7895)	0.1042*** (3.2953)
Export Orientation	0.0758*** (6.358)	0.0812*** (6.3928)	0.0611*** (4.5038)	0.0584*** (8.3887)	0.0570*** (7.5782)	0.0511*** (6.2591)
Infrastructure	0.0786** (2.0871)	0.1626*** (4.1194)	0.1498*** (3.8317)	0.0488*** (3.3977)	0.0427** (2.1491)	0.0407** (1.9744)
Financial Development	-0.0192 (-1.6112)	-0.0280** (-2.1825)	-0.0209 (-1.6331)	-0.0123** (-2.4468)	-0.0135** (-2.3859)	-0.0098* (-1.6709)
Capital Market Openness	0.8320*** (3.7876)	0.6599** (2.5602)	0.4623* (1.7812)	0.4641*** (4.2016)	0.2064 (1.4117)	0.0741 (0.563)
ICT Environment	-0.0422** (-2.5181)	0.2758 (1.0683)	0.7378*** (2.6192)	-0.0227** (-2.0421)	0.2663*** (2.9976)	0.6044*** (5.2177)
Relative Wage	-0.1134 (-1.1609)	-0.0238 (-0.1834)	-0.1621 (-1.2204)	-0.0009 (-1.455)	-0.1155* (-1.8353)	-0.165*** (-2.7115)
Natural Resources	2.1585*** (2.7694)	1.5106* (1.7558)	1.1100 (1.2973)	1.5147*** (3.6429)	1.0188** (2.5003)	0.2758 (0.7107)
Constant	-24.7622 (-0.5993)	79.7773* (1.6666)	175.3287*** (3.285)	-34.6816** (-2.4069)	28.6585 (1.5143)	94.21*** (4.3114)
J-statistic				**0.6008**	**1.3190**	**0.4003**
P-value of J-statistic				**0.4383**	**0.2508**	**0.5270**
Adjusted R^2	**0.2607**	**0.2608**	**0.2798**	**0.3523**	**0.3542**	**0.3726**

Table 3: GMM Results for Each Measure of Institutional Quality

	VA	PS	GE	RQ	RL	CC
Institution	-2.5054*** (2.6432)	-3.3324*** (-3.2295)	-4.0818** (-2.1533)	-2.8144** (2.4482)	-9.9408** (-2.4817)	-7.2735** (2.2515)
Institution^2	0.4474*** (2.7178)	0.4408** (2.3212)	0.6758** (2.5599)	0.5791** (2.1016)	1.6350*** (5.0094)	1.2716*** (5.0296)
Economic Growth	0.4530*** (3.9154)	0.5204*** (4.4278)	0.4152*** (3.4756)	0.4765*** (3.7738)	0.3582*** (3.3537)	0.3761*** (3.3933)
GDP	-1.1571*** (-5.9611)	-0.9654*** (-5.3933)	-0.6446*** (-2.7195)	-1.0240*** (-5.2217)	-0.5435*** (-3.1869)	-0.7285*** (-4.2448)
Surrounding Market Potential	-4.8039** (-2.4827)	-6.3786*** (-3.0124)	-4.2767*** (-2.7587)	-5.4231*** (-2.8862)	-8.1316*** (-4.2825)	-5.6399*** (-3.3908)
Inflation	-0.0357 (-1.1115)	-0.0307 (-1.0184)	-0.0378 (-0.9401)	-0.0098 (-0.2684)	-0.0545 (-1.4356)	-0.0432 (-1.43)
Labor Force Supply	0.1287*** (4.7193)	0.1061*** (3.5637)	0.1503*** (4.8448)	0.1262*** (3.871)	0.1304*** (4.5569)	0.1479*** (5.3631)
Export Orientation	0.0627*** (7.8994)	0.0496*** (6.0927)	0.0558*** (6.2253)	0.0532*** (6.9382)	0.0491*** (6.5101)	0.0429*** (6.4218)
Infrastructure	0.0408** (2.1836)	0.0267 (1.3173)	0.0475** (2.2789)	0.0463** (2.2137)	0.0506** (2.3967)	0.0510** (2.5139)
Financial Development	-0.0107* (-1.7962)	-0.0071 (-1.1703)	-0.0125** (-2.1547)	-0.0124** (-2.0388)	-0.0095 (-1.6414)	-0.0071 (-1.3278)
Capital Market Openness	0.0789 (0.5784)	0.1827 (1.2439)	0.2453* (1.9019)	0.1016 (0.7191)	0.1036 (0.8729)	0.1426 (1.1248)
ICT Environment	0.8132*** (3.6981)	0.9577*** (4.0178)	0.8473*** (3.8628)	1.0226*** (4.4736)	1.392*** (5.3994)	1.1193*** (4.6522)
Relative Wage	-0.1506** (-2.5025)	-0.2164*** (-2.8)	-0.0985* (-1.747)	-0.1986*** (-2.832)	-0.1147** (-2.1549)	-0.1172** (-2.205)
Natural Resources	1.1270*** (2.7762)	0.9780** (2.2438)	0.6092 (1.4835)	0.5706 (1.4623)	0.2233 (0.5448)	0.4678 (1.2316)
Constant	55.9092** (2.5664)	73.8227*** (3.0984)	43.0418** (2.566)	61.6192*** (2.908)	86.4624*** (4.1856)	59.4156*** (3.1668)
J-statistic	**1.5819**	**1.6697**	**0.4424**	**1.5073**	**0.4694**	**0.7442**
P-value of J-statistic	**0.2085**	**0.1963**	**0.5060**	**0.2196**	**0.4933**	**0.3883**
Adjusted R^2	**0.3715**	**0.3544**	**0.3780**	**0.3481**	**0.3761**	**0.3763**

Note: VA is voice and accountability, PS is political stability and absence of violence, GE is government effectiveness, RQ is regulatory quality, RL is rule of law, and CC is control of corruption.

Table 4: The Threshold Value of Institutional Quality on FDI Inflows

Sub-index	VA	PS	GE	RQ	RL	CC
Threshold Value	-0.20	0.78	0.02	-0.57	0.04	-0.14

Source: Authors' own calculation

Note: VA means voice and accountability, PS is political stability and absence of violence, GE is government effectiveness, RQ is regulatory quality, RL is rule of law, and CC is control of corruption.

5. Conclusion and Implications

5.1. Conclusion

This study explores the non-linear effects of institutional quality on FDI inflows in 34 developing countries in Asia and Eastern Europe for the period from 2000 to 2017. As a proxy for institutional quality, I use Worldwide Governance Indicators which include six measures. The six sub-indices are so highly correlated with each other that it may cause the concern for multicollinearity to use any combination of them in a single equation. So, I have created an aggregate index which is estimated as the first principal component of the six measures through a principal component analysis to

investigate the overall effect of the six dimensions of institutional quality altogether on FDI inflows as well as that of respective indicator. Seven different equations are established accordingly, each containing, respectively, one of the 6 indicators of institutional quality or the composite index.

Both pooled regression and GMM are employed as methodology, where GMM proves to have a higher adjusted R-squared and more significant variables than pooled regression.

In model 2 that includes only the linear term of institutional quality, it appears insignificant. However, model 3 incorporating the square term of institutional quality into the model 2 shows a significantly positive coefficient of the quadratic term of institutional quality variable. The result indicates that institutional quality affects FDI inflows non-linearly. In other words, an improvement in institutional quality, when the quality stays below a certain threshold level, may not increase FDI inflows, and only when the quality is above the threshold, it can attract more FDI inflows.

Relative labor cost among control variables shows a significantly negative coefficient in model 3 which proves to explain the relationship best of all the models as mentioned above. It means that as the labor cost of target countries declines as compared to that of China, more FDIs flow into the target countries. This result reassures the argument that MNEs have chosen these developing countries to replace China due to China's labor cost upheaval.

While GDP and surrounding market potential show significantly negative coefficients, economic growth proves to be significantly positive. As expected, efficient seeking variables such as labor force supply, export orientation, infrastructure, and ICT environment show significantly positive coefficients. Natural resources variable also appears significant and positive in most cases.

The threshold values for voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, and control of corruption appear to be -0.20, 0.78, 0.02, -0.57, 0.04, and -0.14, respectively.

5.2. Implications

The empirical result of this study provides some implications for the developing countries of my subject. It suggests what the target countries should do to attract more FDI inflows and thus to develop their economies. In doing so, they may face numerous challenges which should be overcome by government side rather than by individual side. Below are presented my detailed implications for the governments of the target countries.

Firstly, they should endeavor to upgrade the institutional quality above the threshold level to attract more FDIs. As the result shows, over 60% of the target countries have their institutional quality levels below the threshold value. The efforts may include creating a more business-friendly environment by lowering risks and obstacles related to the institutions MNEs often face when undertaking FDIs in those countries. The threshold for political stability appears higher than the other sub-indices, which implies that the governments need to increase political stability prior to the other institutional dimensions to reach the threshold level or to be above that level. Political stability can be greatly enhanced by stabilizing the political situation with stable state administration. It means governments should also lower the possibility of occurrence of political instability such as coups and civil wars which significantly undermine the political stability. This can be evidenced through Thailand case recently. Thailand has recently suffered a military coup due to fierce political strife, which has greatly reduced the institutional quality of the country.

Often times, the efforts may face tremendous resistance by the bureaucrats or the politicians there because improvement in institutional quality often means weakened power or privileges of those groups. As Landes (1998) proposes, if culture is a determinant factor in shaping institutions, it may be dubious or skeptical to improve them. On the flip side, Boudreaux, and Holcombe (2018) argue, from an examination of institutional quality over 30 years, that countries with low-quality institutions have improved their institutional qualities.

Secondly, there is a good chance that the labor cost of these countries will rise in the future in accordance with economic development triggered by FDI inflows towards them. Then, cheaper labor may no longer be a determinant factor in defining the degree of attractiveness of the host countries to FDI activities especially motivated to seek economic efficiency. In such a case, improvements in institutions can offset the disadvantages of the rising labor cost by decreasing hidden costs of MNEs' business operations.

5.3. Limitations and Future Research

While providing significant theoretical contributions as well as useful implications for policy makers in the target countries, this study has some limitations to be addressed by future studies. The limitations and further research avenues are as follows:

First, since the study has been conducted only on countries with relatively poor institutional quality except for Singapore due to sample restriction, one may find it difficult to generalize my result of non-linearity. An extended sample might have produced a totally different result.

Second, due to data unavailability in developing countries, this study was not able to consider such variables as workers' educational level, the development level of science and technology, tax rate, and so on that may be considered significant in MNEs' location choices. Third, there is a possibility of measurement errors in proxy variables such as infrastructure and labor costs. As a proxy for infrastructure, for example, the status of roads, railways, and sea ports are often used. But these data for the developing countries are often not available. So, instead of these variables, gross fixed capital formation is employed as a proxy for infrastructure in this study. Also, due to the lack of exact data for labor costs, I roughly calculated labor costs by using GDP and labor forces data from World Bank. Fourth, the determinants of FDI inflows may vary depending on the motivations behind the FDI activities. To reflect the motivation of FDI in my analysis, I need to extract the exact amount of FDI with a certain kind of motivation from the total amount of inward FDI. Yet, such data also do not exist.

Lastly, comparative studies are recommended for future studies which will need to expand the target countries to developed as well as developing countries to derive more exact explanation and comparison between the two different country groups in regard to the effects of institutional quality on FDI inflows.

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Appendix: List of Sample Countries

Asia: Bangladesh, Brunei Darussalam, Cambodia, India, Indonesia, Lao PDR, Malaysia, Myanmar, Nepal, Pakistan, Philippines, Singapore, Sri Lanka, Thailand, Vietnam, Kazakhstan, Kyrgyz Republic, Tajikistan, Uzbekistan

Eastern Europe: Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Estonia, Hungary, Republic of Moldova, North Macedonia, Poland, Romania, Slovakia, Slovenia, Ukraine