

The Influence of Institutional Quality towards Foreign Direct Investment (FDI) Inflows in ASEAN's Developing Countries

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Abstract

This paper discusses the influence of institutional quality on FDI stock inflows towards eight developing countries in Association of Southeast Asian Nations (ASEAN). Institution in this paper is classified in four forms, namely legal, bureaucratic, politics, and economic institutions. This paper utilizes the method of Principal Component Analysis (PCA) and panel data regression. After using PCA method to identify which variables hold the most importance, the authors then constructed an individual index for four institutions as defined before. These indices are then used for panel data regression. The result of this paper indicates that out of four forms of institutions, three institutions are found to be significant determinants. These three institutions are legal, bureaucratic, and economic institutions. Surprisingly, while bureaucratic institution has positive coefficients, the other two forms of institutions have negative coefficients, suggesting that FDI stock inflows towards developing countries in ASEAN are more likely to be motivated by weak legal and economic institutions.

Keywords: FDI stock, institutional quality, principal component analysis, developing countries

JEL Classification: F21, P45

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1. Introduction

Foreign Direct Investment (FDI) is one of the most significant sources of funding either economic growth or economic development for developing countries. According to International Monetary Fund (IMF), FDI has an important role as one of the external private sources of funding for developing countries that is relatively lower in risk and equally beneficial as the other sources. FDI is defines as one of several forms of investment which encompasses relationship as well as long-term commitment by a foreign entity (home country) towards the recipients (host country).

Foreign entity comprises of foreign investors, that might be represented by an individual or a

corporation (UNCTAD, 2007). One of the keywords to understand the significance of FDI is its long-term commitment. A long-term commitment explicitly implies that a foreign entity can either acquire or build a new company in the recipient country because FDI is specifically concerned with long-term gains. Therefore, FDI is distinct compared with the other forms of investment because of its long-term commitment and interest in long-term gains in the recipient country.

Due to the aforementioned particular reason, FDI has become an attractive source of external private funding for developing countries. This is partly due to the fact that developing countries grapple with two main problems, namely low productivity and low competitiveness

(Chauduri, 2014; Amirahmadi & Wu, 1994). These two problems prompt developing countries to be trapped in a vicious circle of poverty and underdevelopment. Low productivity and competitiveness will result in lower nominal wage, increasing poverty, high unemployment rate, and domination from low-skilled workers. All of the mentioned problems can be partially resolved by FDI.

According to previous research that have been done extensively, FDI is found to be effective in encouraging technology spillovers, assisting better human capital formation, increasing competitiveness, forming better business climate, increased engagement with international trade, and increasing the competitiveness of local business with relatively lower risk and higher chance to succeed (OECD, 2002; Bomström, Lipsey, & Zejan, 1994; Balasubramanyam, Salisu, & Sapsford, 1996).

This paper will be focusing on FDI in Association of Southeast Asian Nations (ASEAN). ASEAN is a regional organization that is mostly composed by developing countries. Overall, ASEAN has 10 members, which consists of Singapore, Brunei Darussalam, Indonesia, Malaysia, Thailand, Philippines, Vietnam, Lao People's Democratic Republic, Cambodia, and Myanmar. According to International Monetary Fund's (IMF) classification of countries, only Singapore falls into the category of developed country and the rest of ASEAN members are categorized as developing countries (IMF, 2018). As a region, ASEAN has quickly established itself as one of the biggest recipients of FDI due to several reasons.

Firstly, ASEAN's total export share surpassed seven percent of global exports. Secondly, the combined Gross Domestic Product (GDP) of ASEAN reached 2.8 trillion US Dollar in 2017, making ASEAN the sixth biggest economy globally. Thirdly, ASEAN's average economic growth reached 5.4 percent which is beyond global economic growth. Fourthly, in 2030, it is predicted that ASEAN will become fourth largest

economy in the world (ASEAN, 2019). These four factors encourage ASEAN to become a promising region for receiving FDI.

ASEAN's attractiveness as FDI recipient is further proven by the increasing number of FDI inflow. Although FDI inflow towards ASEAN tends to fluctuate, there has been an increasing trend over the past ten years. ASEAN recorded FDI inflows of more than 100 billion US Dollar in 2010 and then reached more than 150 billion Dollar in 2019. In terms of developing countries, nine members of ASEAN receive overall 47 percent from the aforementioned number, or around 59 billion US Dollar for the past ten years.

The number also fluctuates along with the total FDI inflows towards ASEAN. Despite the fact that majority of FDI inflow towards ASEAN still goes to Singapore, developing countries are also important players and are starting to catch up. Developing countries only received 50.9 percent of total FDI inflows towards ASEAN in 2010 but managed to earn 66.8 percent in 2019. This marks the increasing importance of developing countries as FDI recipients.

As time changes and global issues become more complex, research on FDI determinants do not solely focus on traditional macroeconomic factors but also other non-traditional factors, in which one of them is institutional quality. The importance of institutional quality as one of FDI determinants is reflected on World Bank's yearly report titled Global Investment Competitiveness Report. According to the report, institutional quality is one of five most important determinants of FDI for global investors. Political stability ranks first, followed with legal institutions and regulatory quality, domestic market size, and overall macroeconomic stability (World Bank, 2018). This finding highlights the fact that although macroeconomic indicators are still important, they are no longer the sole determinants of FDI in developing countries because non-macroeconomic determinants are becoming more relevant.

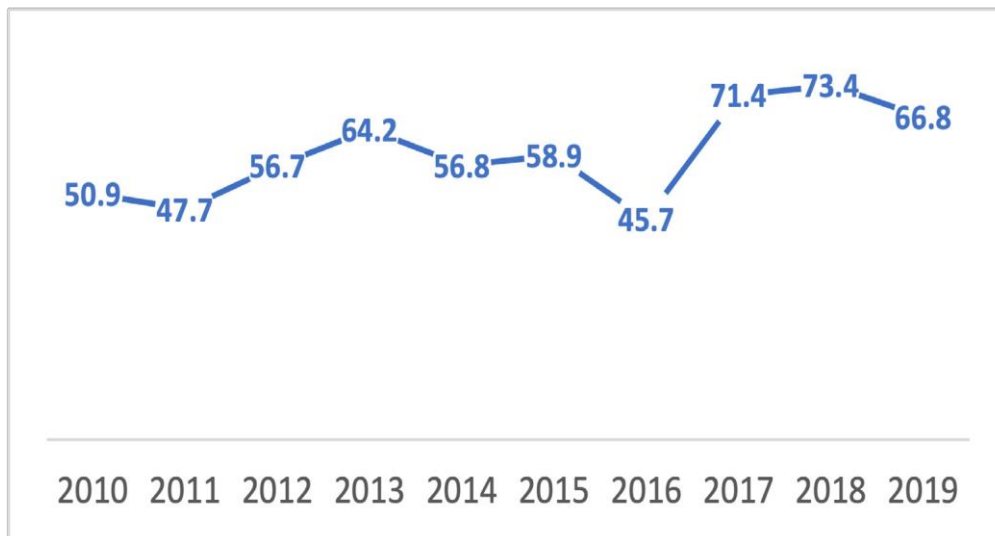


Figure 1 Total FDI Inflows (Share in %) to ASEAN Developing Countries (2010-2019)

Source: World Bank and ASEAN Statistics

1.1 Importance of Institution Quality as FDI Determinant

Theoretically, the importance of institutions has been discussed by North in 1990. North was one of the first authors to formulate a theory about institutions. According to North (1990), institutions are defined as the rules of the game in a particular society that regulates human interaction. This interaction consists of different aspects, from political, social, and economic aspects but have the same purpose. Institutions can be formal like a constitution, or informal like conventions and customs. North (1990) argues that institutions are formed to reduce uncertainty in human exchange or exchange activities carried out by humans.

Furthermore, institutions are also formed to regulate individual behaviour in order to ensure that each individual complies with the rules. Thus, institutions provide a framework for interactions in society to assure that the continuity of interactions. Therefore, the role of institutions is crucial in every aspect of human life, including economic activity. In relation to economic activity, North (1990) stated that institutions affect transaction and production costs in several ways.

Ali et al (2010) explain that transaction costs are defined as costs associated with economic exchange. Without the existence of an institution, there will be underlying uncertainty in the transaction activity because no one formed the rules to guarantee the safety of such activity. Further, institutions can influence economic activity through production costs. Ineffective institutions can increase production costs through two things, namely supply chain disruption due to the unforeseen and unpredictable decisions with bureaucratic ineffectiveness. Institutional inefficiency can lead to lengthy bureaucratic processes, which generally makes it difficult for companies to obtain business permits and other forms of permits necessary for their businesses. This inefficiency can cause a considerable increase in production costs and reduce the level of competitiveness of a certain country with neighbouring countries.

There are several reasons that underlie the importance of institutions for FDI. First, good institutional quality can increase investor confidence to reduce transaction uncertainty. Second, the quality of institutions is often associated with good productivity prospects. This implies that the better the quality of a

country's institutions, the better it can attract foreign investors because their productivity is higher. Third, the poor quality of institutions will increase the cost of FDI in the form of corruption (Wei, 2000).

Poor institutional quality are often associated with inefficiency and long bureaucratic chains, which inevitably increase the likelihood of corruption. Fourth, FDI is highly susceptible to all forms of uncertainty because sunk costs tend to be high. Therefore, it can be very risky for a multinational company to invest in countries with poor institutional quality. Uncertainty in the form of government inefficiency, policies that can change without legality, and weaknesses in legal institutions will influence decisions taken by multinational companies. The worse the quality of a country's institutions, the higher the costs and risks faced by foreign companies because of the uncertainty (Quéré et al, 2007).

consists of constitutions while the latter consists of customs. These types of institution are created by humans to limit human behavior and produce a framework for interaction (Ali, 2010).

In economic context, institution plays an important role to reduce uncertainties and transaction cost that are present in economic exchanges. Uncertainties and transaction cost arise due to information asymmetry in which information is only available to a certain party (North, 1991). The other party will not have a complete information about another party, thus increasing the risk of unfair practices such as cheating or deny agreements.

Therefore, institution acts as a constraint to prevent unfair behaviors. This is important in economic exchanges where transactions are made between individuals, companies, or corporations with high risks. Institutions act as a third party that has the legitimacy to enforce rules and agreements which in turn will reduce uncertainties in economic exchange (North, 1991). The role of institutions is even more enhanced for foreign investors because of three major reasons.

First, foreign investors face a higher uncertainty than local investors. The presence of reliable and good quality institutions will boost their confidence in a country's ability (Bailey, 2018). Second, low-quality institutions are related to higher cost for FDI in the form of corruption (Wei, 2000; Sabir et al., 2019). Inefficiency and long bureaucracy will increase the likelihood of corruption which will increase undesirable cost on foreign investors. Lastly, FDI is highly susceptible towards any form of uncertainties due to its high sunk cost (Peres et al., 2018). Any forms of uncertainty, such as unexpected change in political regime, inefficiency, and weak legal institution will negatively affect foreign investors' decisions (Bénassy-Quéré et al., 2007).

Institution is often composed of several components, ranging from social, economic, politics, bureaucracy, and legal institution. Nevertheless, social institution is excluded from the analysis due to its immeasurability and informality (Kunčič, 2014). Most past research on the importance of FDI inflows towards developing countries find that there is a positive correlation

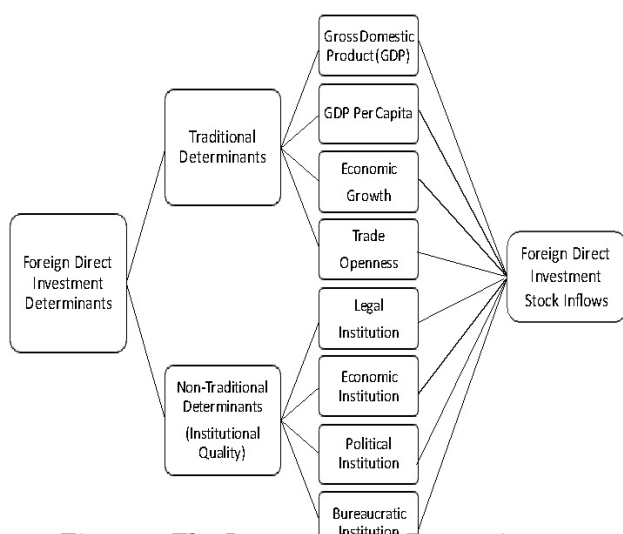


Figure 2 The Impact of FDI Determinants towards FDI Stock Inflows

1.2 Literature Review

The importance of institutions has been extensively discussed in North's theory. North described institution as human-made boundaries to regulate human interactions which mostly consist of political, social, and economic aspects (North, 1980;1981). Institution is divided into two forms, formal and informal. The former

between institutional quality and the amount of FDI received by developing countries. In other words, countries with better institutional quality, often measured by its governance quality, will receive higher amount of FDI compared to those with poor institutional quality.

Sabir et al (2019) examined the effect of institutional quality on FDI using data panel for low, middle, and high-income countries from 1996 to 2016. The authors used six indicators of institutional quality from the World Governance Index (WGI). By using the Generalized Method of Moments (GMM), the authors found that WGI scores did affect the aforementioned categories of countries. In the case of developing countries, several variables such as corruption control, government effectiveness, and political stability are significant and have positive coefficients. Further, the study found that in developed countries, all six indicators used in the paper were significant with positive coefficients. This study proved that the quality of institutions did affect the amount of FDI inflows received by low, middle, and high-income countries, yet the strongest correlation for all indicators was found only in developed countries.

Wernick et al (2009) conducted a study on the effect of the scores of WGI index on FDI inflows in developing countries. The developing countries that were used as samples were India and China with two additional regions dominated by developing countries, namely Latin America and Africa. The authors found that countries with high institutional quality, or high scores on the WGI index, would receive higher FDI compared with those who had low quality. The authors found that the most significant determinants were property rights, bureaucracy, and corruption control. Daude and Stein (2007) administered a study on 152 developing countries using FDI from 34 developed countries with the time period from 1982 to 2002. The author found that the quality of regulation was the main determinant with positive coefficient. Furthermore, other institutional dimensions such as policy uncertainty, excessive regulation, and lack of commitment from the respective governments had caused reluctance from developed countries to invest in developing

countries, thus impeding the FDI inflows from developed towards developing countries.

Bissoon (2012) examined the effect of institutional quality on FDI flows in developing countries. The author used panel data which consists of 45 developing countries in Africa, Latin America, and Asia. Similar to the results of previous studies, the authors find that institutional quality acted as an important influence in determining FDI flows to developing countries. Nevertheless, the authors stated that any increase in the amount of FDI received would only be significant if developing countries were able to improve the quality of institutions at the aggregate level and not on the individual indicator scale. Therefore, increasing the quality of institutions at an aggregate level would be more preferable to attract more FDI.

Ajide and Raheem (2016) conducted a research on member countries of the Economic Community of West African States (ECOWAS). This study used six WGI indicators from 2000 to 2013. The results of the study found that on average, ECOWAS countries had weak and poor institutional quality which caused countries in the region to be unable to attract FDI at a significant level. The author then performed a robustness check by dividing ECOWAS member countries into two groups, namely countries with better institutions and countries with bad institutions. Using GMM for its robustness check, the authors found that ECOWAS countries with better institutional quality were able to receive a larger amount of FDI.

Masron and Nor (2012) examined the effect of institutional quality on the amount of FDI received by eight ASEAN countries (Cambodia, Indonesia, Laos, Malaysia, Philippines, Singapore, Thailand and Vietnam). The quality of the institutions used in the research was the average score for the quality of the institutions and the six individual indicators on the WGI index. It was found that the average value of institutional quality played an important role in determining the FDI inflows to these eight countries. However, when viewed individually, indicators of regulatory quality were not significant in determining FDI flows to these countries. Using FDI as the ratio of GDP, the

authors found that the quality of institutions plays an important and significant role in explaining the ability of these countries to obtain FDI.

This paper will focus on the analysis of institutional quality as determinants of FDI inflows towards eight ASEAN developing countries. Unlike other past research that only consider institutional quality in terms of legal and political aspects, this paper classifies institution in four forms namely legal, politics, economic, and bureaucracy. The choice to classify institutions in four different forms is intended to capture institutions as a whole to give a comprehensive analysis.

Further, while the other past research only used data from established index such as World Governance Indicators (WGI), this paper will

compile several indices from established and reliable sources to construct an individual index

for each form of institution using the method of Principal Component Analysis (PCA). By using PCA, the authors manage to avoid the problem of multicollinearity and able to retain the most important variables to be constructed into an index. Further, the research of the impact of institutional quality using PCA towards

ASEAN's developing countries has never been accomplished before. This research aims to

identify whether institutional quality acts as an important determinant for FDI stock inflows in developing countries of ASEAN.

Therefore, this paper will develop five main hypotheses. First, traditional macroeconomic indicators such as GDP, GDP per capita, economic growth, and trade openness should be statistically significant along with positive coefficients. This implies that the higher the values of these variables, the higher the FDI that will be received by developing countries of ASEAN. Secondly, all four forms of institution considered in this paper, namely legal, bureaucratic, economic, and political institutions should have a positive coefficient and statistically significant. This arguably means that better institutional quality, as represented by the higher value of all four indices, should attract more FDI into ASEAN's developing countries.

2. Research Method

2.1 Country Sample

This research will be focusing on eight ASEAN developing countries from 2013 until 2019. The eight countries used as sample are Indonesia, Malaysia, Philippines, Thailand, Cambodia, Lao People's Democratic Republic, Vietnam, and Brunei Darussalam. Although Myanmar is also a part of ASEAN and is also categorized as a developing country, it is not included in this research due to the lack availability of data. The complete list of countries used for this research will be displayed in table 1.

Table 1 Ranked List of FDI Stocks Received by ASEAN Developing Economies

		FDI Stock
Rank	Country	Inflows 2019 (in Million US\$)
1	Indonesia	230445
2	Thailand	208765
3	Malaysia	139976
4	Vietnam	118079
5	Philippines	69079
6	Cambodia	25012
7	Lao's People Democratic Republic	6714
8	Brunei Darussalam	6379

There is a stark difference between the amount of FDI stock received by ASEAN's developing economies. Indonesia has the highest FDI stock inflows in 2019 of all ASEAN developing economies with the total FDI stock amounting to more than 230 million US\$. Thailand ranks second with more than 208 million US\$ of FDI stock in 2019.

Malaysia ranks third with more than 139 million US\$ in FDI stock inflows, followed by Vietnam, Philippines, Cambodia, Lao's People Democratic Republic, and Brunei Darussalam. Vietnam earned more than 118 million US\$ of FDI stock inflows in 2019. Philippines earned less than 70 million US\$ of FDI stock inflows. Cambodia earned less than half of Philippines',

which amounted to 25 million US\$. Lao's People Democratic Republic and Brunei Darussalam earned less than 7 million US\$, which made them developing economies with the least amount of FDI stock inflows in ASEAN.

2.1 Data and Data Source

Unlike several of previous research that used FDI inflows as its dependent variable, this paper will utilize the usage of FDI stock as its dependent variable. The usage of FDI stock, instead of FDI inflows, is beneficial due to two reasons. First, the usage of FDI stock enables the authors to measure local investment ownership better because FDI stock is a type of FDI that is funded by local capital market (Devereux & Griffith, 2002; Bénassy-Quéré et al, 2007). Second, due to the first reason, FDI stock is more stable compared to FDI inflows for a country's purchasing power. especially in smaller developing countries (Bénassy-Quéré et al, 2007).

There are eight independent variables used in this paper, namely Gross Domestic Product (GDP), GDP per capita, economic growth, trade openness, legal institution, economic institution, political institution, and bureaucracy institution. The first four variables, which are GDP, GDP per capita, economic growth, and trade openness are considered in this paper as control variables. GDP is used as a proxy for market size, where bigger GDP implies a bigger market size that is often attractive for foreign compaies (Azam & Lukman, 2010; Wernick et al, 2009).

GDP per capita is used as a orixy to measure a country's purchasing power. Higher GDP per capita implies that the people have higher purchasing power (Wernick et al, 2009; Fedderke & Romm, 2006). This variable is significant as purchasing power is Trade openness measures the ratio of export and import to GDP, where a higher ratio implies that a country is becoming more open towards international trade (Chakrabarti, 2001; Ali et al, 2010). The data used for these control variables are all taken from World Bank.

The remaining independent variables, particularly economic, legal, politics, and bureaucracy institutions, are used to measure the quality of institutions comprehensively. There is virtually no single understanding of the definition of economic institution. Nevertheless, economic institution is often referred as how institutions could facilitate economic transaction in a country to reduce the risk of said transaction (Wiggins and Davis, 2006). The quality of economic institution is often determined by the inclusivity and the access of its labor and market goods along with its financial institutions. Legal institution measures how a country's legal system is able to either formulate and implement laws consistently and transparently along with its regulatory quality (Lehne et al, 2014). Legal institution is the most important as it is the only form of institution which has the absolute power to regulate and implement the laws.

Table 2 List of Initial Variables Used for PCA

Economic Institution		Legal Institution		Bureaucratic Institution		Political Institution	
Variable	Source	Variable	Source	Variable	Source	Variable	Source
Financial Institution	FD	Enforce	EDB	Taxes	EDB	Corruption	WGI
Financial Access	FD	Minority Investors	EDB	Open	EDB	Stability	WGI
Financial Depth	FD	Rule of Law	WGI	Electricity	EDB	Voice & Account	WGI
Financial Efficiency	FD	Property Rights	GCR	Construction Permit	EDB	Check & Balance	GCR
Goods Market	GCR	Intellectual Property	GCR	Start Business	EDB	Transparency	GCR
Labor Market	GCR	Judicial Independence	GCR	Regulatory Quality	WGI	Public Trust	GCR

Bureaucratic institution refers to the efficiency of implementation process of government's policies by its own agency (Farazmand, 2018). A good quality bureaucratic institution is typically measured by the time it takes for a multinational company to attain the permits and approvals they need before operating in a certain country.

Political institution measures how a government is elected and formed in a country. Therefore, good quality political institution is often measured by how democratic it is. A country that is more democratic has a clear check and balance policy to control government officials in order for them to not abuse their power or become involved in power corruption which implies a higher level of trust (Freitag & Bühlmann, 2009).

The indices of these four forms of institutions will be constructed from 16 variables that the authors attain from several reliable indices such as Ease of Doing Business Index (EDB), World Governance Indicators Index (WGI), Global Competitiveness Report (GCR), and Financial Development Index (FD). All of the 16 variables used to construct the indices will be presented in table 2.

2.2 Panel Data Regression

This paper will use panel data regression method that is a combination between time-series and cross-section. The usage of panel data is necessary because we are observing eight countries for a time period of seven years. Using panel data for this paper will help the authors in observing changes across entities and time that is not possible in pure cross-sectional or time-series data. Further, panel data will improve the efficiency of economic estimates since it contains more degrees of freedom and sample variability.

Generally, panel data estimation is conducted through three main models, namely Ordinary Least Square (OLS), Fixed Effect Model (FEM), and Random Effect Model (REM). OLS approach is used when there is no individual heterogeneity represented by a constant intercept value for each observation (Gujarati & Porter, 2009).

The other two models, FEM and REM, assume that individual heterogeneity exists.

FEM is an appropriate specification if the heterogeneity is correlated with the independent variable. REM is chosen if the heterogeneity is uncorrelated with independent variable. Further, Batalgi (2005) stated that REM approach is more suitable if a sample of individual is drawn randomly from a large population. In order to choose the most appropriate model, the authors will conduct several statistic tests such as Chow Test, Hausman Test, and Lagrange Multiplier Test.

2.3 Principal Component Analysis (PCA)

PCA is a data analysis technique that is utilized by reducing the data dimension while still retaining the variations in the data. The data reduction allows each sample to be represented by fewer variables that still contains the same information as the original data (Jolliffe, 2010). Therefore, by using PCA, the amount of the original variables will be reduced significantly but still contain the same values or information like the original data. PCA is a very effective tool to be used for analysis if there are independent variables in large quantity along with high correlation between the variables.

The research will utilize PCA method because there is simply no single and comprehensive index that can measure institutional quality due to its broad definition. The quality of an institution is unable to be measured just by one or two variables because it consists of several elements. For example, the quality of legal institution is unable to be measured just by its judicial independence, but also by its ability to enforce laws and rules and to ensure the protection of people.

Before applying PCA, there are two statistical tests that need to be conducted, namely Bartlett Test and Kaiser-Meyer-Olkin Test. Bartlett Test is a statistic test that is used to detect the significance of the correlation between independent variables. If there is no high correlation between the independent variables, then these variables cannot be utilized to construct an index (Bhasin & Garg, 2019). The Bartlett test criterion is that if the result is lower than 0.05, then PCA can be used because it means that there is a significant correlation between variables.

The KMO test is a test conducted to determine whether the data used has met the eligibility to be factored. In contrast to the Bartlett test, KMO test requires a value greater than 0.5 which indicates the feasibility of sampling adequacy.

After performing the aforementioned statistical tests, the next step is to construct an index using its factor loading. Higher factor loading implies that the variable has stronger explanatory ability. The criteria used for this paper is that the component that will be chosen has to be able to explain at least 65% (0.65) of the variance. Therefore, variables with factor loadings below 0.65 will not be chosen to construct an index. The next step after choosing the appropriate variables is to rotate the initial PCA results with the Varimax rotation method. This rotation is carried out to maximize the variance of the squared correlation between variables and factors. This step is necessary to avoid the existence of factors with low or medium variable correlation (Dunteman, 1989).

2.4 Index Construction

After the initial PCA analysis has been conducted, the next step is to construct the appropriate indices for the four institutions. The selected variables with the highest factor loadings will be normalized. After normalization, the index construction will be utilized based on the next mathematical equation as proposed by Bhasin and Garg (2019):

$$Index = \sum (W_i^t NX_{ic}^t) \quad (1)$$

Where *index* is the value of each institution, *i* refers to variables of the index that are chosen based on previous PCA result, *c* is individual country, *t* refers to time, W_i is the weight of selected variables that correspond to the coefficient component of matrix, and NX_i is the values from selected variables that have been normalized.

The three methods of analysis in this paper, namely PCA, index construction, and panel data analysis are correlated with each other to achieve the aforementioned research objectives. Due to the complexity of institutional quality, it is impossible

to use separate variables for panel data regression due to higher possibility of multicollinearity. Further, it will be harder to interpret the result due to the numbers of independent variables used in the analysis. Therefore, by using PCA and index construction to formulate four different indices, the authors are able to compress the vast data without changing the essential information, thus simplifying the analysis. Further, by using panel data regression, the analysis can be more meaningful and can easily interpreted by the readers since the usage of panel data will enable the authors to provide a comprehensive analysis about the impact of institutional quality towards FDI stock.

2.5 Model Specification

The model that is used for this paper is written as follows:

$$FDI_{STOCK} = \alpha_0 + \beta_1 GDP + \beta_2 GDP_{CAP} + \beta_3 GROWTH + \beta_4 OPEN + \beta_5 INS_{ECON} + \beta_6 INS_{LEGAL} + \beta_7 INS_{POL} + \beta_8 INS_{BUREAUCRACY} + u$$

where FDI_STOCK is the total amount of FDI stock inflows towards the host countries,

α_0 is constant term, β^n (1-8) is the individual parameter that is going to be estimated for each of independent variable, GDP is the Gross Domestic Product of the host countries. PDB_CAP is GDP per capita, GROWTH is the annual percentage of yearly economic growth, OPEN is the ratio of imports and exports to GDP, INS_ECON is the index score of economic institution, INS_LEGAL is the index score of legal institution, INS_POL is the index score of political institution, INS_BUREAUCRACY is the index score of bureaucratic institution. The indices' scores for the aforementioned institutions will range from 0 to 1, where 0 is the lowest (poor quality institution) and 1 is the highest (good quality institution). *u* is the error term. All data used for this regression analysis has been normalized due to its value difference.

2.5 Estimation Procedure

The first step of analyzing the data is to

conduct PCA on the raw data. Because our data come from various sources, it is necessary to normalize the value of each variable so that the results will not be biased. The normalization will be conducted through this equation:

$$z = \frac{\text{value} - \text{mean}}{\text{standard deviation}} \quad (3)$$

where z is the normalized value, value is the initial value of the raw data, mean is the average value of each variable, and divided by the standard deviation which is the dispersion of a dataset of the value for each variable. This will result in the data having mean of 0 and a standard deviation of 1. After normalization is completed, all the variables will be transformed into the same scale.

The next step is to compute the covariance matrix. This measures how two variables vary. Since our data has been standardized and has mean of zero, the covariance matrix Σ is calculated by the next equation:

$$\Sigma = \frac{1}{n - 1} X^T X \quad (4)$$

where Σ is the covariance matrix, n is the total amount of data, and X^T is the transpose of matrix X (Jolliffe, 2010).

The next step is to perform an eigenvectors analysis of the covariance matrix. Eigenvalues are the equivalent magnitude, which means that the eigenvector that has the largest eigenvalue is going to depict the direction of maximum variance. After the analysis is computed, it needs to be rearranged based on the magnitude of their eigenvalues. This procedure is necessary to determine the selection of principal components by determining the cut-off value. In general, the eigenvectors with the lowest eigenvalues have the smallest or the least information about the distribution of the data. The last step is to rotate the matrix and project the new data for our index formulation.

The next step is index formulation. After the components are selected, the rotated components will show the weight of each variable. The weight

of each component is multiplied by the normalized value of each variable as presented in equation 1. The result of each pillar of institution will be summed up and used in our panel data regression.

3. Result and Discussion

3.1 Result

3.1.1 Principal Component Analysis

Each form of institutional quality will be analyzed individually using all the component variables that have been presented on table 1. The first step is to identify whether our data sample has fulfilled the standard of sampling adequacy through the Bartlett and KMO tests.

The authors conducted the aforementioned tests and came to a conclusion that the data sample that is used to construct four institutional quality indices is adequate. This is proven by the values of both Bartlett and KMO tests, where the value was smaller than 0.05 and bigger than 0.5, respectively. The result of both tests will be presented in table 3.

Table 3 Bartlett and KMO Test Result

Institution	Bartlett Test	KMO Test
Legal Institution	0.000	0.735
Economic Institution	0.000	0.669
Political Institution	0.000	0.635
Bureaucratic Institution	0.000	0.673

The next step is to conduct an analysis on independent variables that the authors will choose to formulate each index. As mentioned before, the authors will use cutoff from factor loading no smaller than 0.65 which means that only variables with factor loading scores higher than or equal to 0.65 will be used to construct the individual institutional quality index. The extracted components with its factor loading for each of the institutional quality index will be presented on table 4,5,6, and 7.

For the first institution, namely legal institution, the authors extracted three components that explain 93 percent of the cumulative variance. The three components are

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the ability to enforce laws (*enforce*), protection towards minority investors (*Minority_Investors*), and intellectual property protection (*Int_Property*). Each of these components has factor loading 0.73, 0.91, and 0.67, respectively.

Table 4 Rotated Components of Legal Institution

	Components		
	1	2	3
Enforce	-0.18	0.73	0.17
Minority Investors	0.02	0.04	0.91
Rule of Law	0.19	0.56	-0.12
Property Rights	0.56	-0.08	0.26
Intellectual Property	0.66	-0.09	-0.042
Judicial Independence	0.39	0.35	-0.21

For economic institution, the authors extracted four components that could explain 96 percent of cumulative variance. These four components are financial access (*financial_access*), depth of financial institution (*financial_depth*), financial efficiency (*financial_efficiency*), goods' market performance (*goods_market*), and labor market performance (*labor_market*). Each of these four components has factor loading amounting to 0.91, 0.95, 0.67, and 0.97, respectively.

Table 5 Rotated Components of Economic Institution

	Components			
	1	2	3	4
Financial Institution	0.33	0.37	0.20	-0.11
Financial Access	-0.04	0.91	-0.03	0.02
Financial Depth	0.65	-0.13	0.11	-0.09
Financial Efficiency	-0.02	-0.03	0.95	0.03
Goods Market	0.68	0.02	-0.19	0.13
Labor Market	0.01	0.01	0.03	0.97

For bureaucratic institution, the authors extracted three main components that could explain 87 percent of cumulative variance. These three components are access to pay taxes (*taxes*), conducting exports and imports (*open*), and easiness to start business (*StartBusiness*). Each of these three components has factor loading amounting to 0.74, 0.98, and 0.65, respectively.

Table 6 Rotated Components of Bureaucratic Institution

	Components		
	1	2	3
Taxes	-0.16	0.74	-0.02
Open	-0.01	-0.01	0.98
Electricity	0.42	0.26	0.15
Construction Permit	0.59	-0.05	-0.1
Starting Business	0.65	-0.11	0.05
Regulatory Quality	0.17	0.6	-0.02

For the last institution, specifically political institution, the authors extracted three components that could explain 94 percent of cumulative variance. The three components are corruption (*corruption*), voice and accountability (*voice_accountability*), and check and balance (*check_balance*). Each of these three components has factor loading amounting to 0.93, 0.66, and 0.65, respectively.

Table 7 Rotated Components of Political Institution

	Components		
	1	2	3
Corruption	-0.02	-0.03	0.93
Stability	0.12	-0.61	0.25
Voice & Accountability	0.11	0.66	0.18
Check & Balance	0.65	0.01	-0.11
Transparency	0.5	0.32	0.08
Public Trust	0.53	-0.26	-0.012

Table 8 Selected Components and the Respective Weights

Legal Institution		Economic Institution		Bureaucratic Institution		Political Institution	
Variable	Weight	Variable	Weight	Variable	Weight	Variable	Weight
Enforce	0.61	Financial Access	0.33	Taxes	0.65	Corruption	0.91
Minority Investors	0.71	Financial Efficiency	0.30	Open	0.91	Voice & Accountability	0.68
Intellectual Property	0.41	Goods Market	0.43	Starting Business	0.41	Check & Balance	0.50
-	-	Labor Market	0.45	-	-	-	-

3.1.2 Index Formulation

The formula used for index formulation for each institutional quality is the first equation, where the values from the extracted components are normalized using minimum-maximum (min-max) procedure and then multiplied by the weight for each component. For example, index score of legal institution will be attained through normalization of each extracted component (*enforce*, *minority_investors*, and *int_property*) that is multiplied by the weight and summed up to create the index. The same step is repeated for the remaining three indices. The final result of each index will be used for panel data regression in the upcoming section. The respective weight for each component will be presented on table 8.

3.1.3 Descriptive Statistics

This section will present the descriptive statistics used for the analysis. All data has been normalized into the same range in order to simplify the interpretation of our analysis. The table for descriptive statistics will be presented in table 9. There are 56 observations in this analysis for each variable. Therefore, our panel data is strongly balanced.

Some of the data used are strongly skewed to the right. For example, variables such as FDI Stock, GDP_CAP, INS_BUREAUCRACY, and INS_ECONOMIC are strongly skewed to the right due to the mean value being greater than the median value, while the others are not.

3.1.4 Panel Data Regression

The authors conducted the aforementioned three statistical tests in order to choose the most appropriate model for this regression. After conducting the three tests, namely Chow Test, Hausman Test, and Lagrange Multiplier test, the model that is most appropriate for this panel data regression is random effect model (REM). Chow test showed that the probability value was 0.000 which meant FEM was preferable.

The result of Hausman test showed that the probability value was 0.078 which was higher than the 5% level of significance. Therefore, the chosen model for this paper was REM. Because Chow and Hausman tests presented two different results, the authors applied Lagrange Multiplier test to choose for the best model between REM and FEM. Lagrange Multiplier test showed the probability value 1.000 which meant that REM was better than FEM and OLS. Therefore, the appropriate model for this paper is REM. Further, because this paper uses REM, there should be no need to conduct separate tests to verify classical assumptions because the model has already used the estimation of GLS.

Nevertheless, the authors will still present the correlation matrix to ensure that there are no correlated variables. The result from correlation matrix suggests that there is no high correlation between variables (beyond or equal to 0.8). The correlation matrix and the descriptive statistics will be presented at the appendix section.

Table 9 Descriptive Statistics

Variable	Mean	Median	Standard Deviation	Minimum	Maximum
FDI Stock	0.31	0.23	0.27	0.01	1.00
GDP	0.25	0.24	0.28	0.02	1.00
GDP_CAP	0.16	0.05	0.24	0.01	1.00
OPEN	0.37	0.42	0.28	0.03	1.00
GROWTH	0.71	0.77	0.25	0.01	1.00
INS_LEGAL	0.89	0.88	0.42	0.28	1.69
INS_BUREAUCRACY	1.10	0.87	0.34	0.34	1.79
INS_POLITICAL	0.98	0.91	0.47	0.30	1.80
INS_ECONOMIC	0.72	0.59	0.26	0.40	1.27

Table 10 Random Effect Model Regression Result

Variable	Coefficient	Std. Error	t-Statistic	Prob
GDP	0.8711172	0.1308588	6.67	0.000*
GDP_CAP	0.4150117	0.1661362	2.5	0.012*
GROWTH	0.2800285	0.1616793	1.73	0.000*
OPEN	0.3811749	0.0856013	4.45	0.083***
INS_ECON	-0.2413821	0.0010962	-2.2	0.028*
INS_LEGAL	0.2535515	0.1425007	-1.78	0.075***
INS_POL	0.079216	0.0994685	1.03	0.302
INS_BUREAUCRACY	0.224373	0.0851938	2.26	0.024*
R-squared	83.8			
Adj. R-squared	80.1		Prob > Chi2	0.000

Note: the *, **, and *** denote significance at 1%, 5%, and 10%, respectively

The result of the panel data regression is presented on table 8. The result of the adjusted r-squared was 80.1 which means that this model could explain 80.1 percent of the variation in the FDI stock inflows into ASEAN's developing countries. The result of REM regression shows that not all hypotheses are supported. Four control variables that the authors use for this paper, namely GDP, GDP per capita, economic growth, and trade openness are all significant and have positive coefficients on the significance level 1%, 5%, and 10%. For the first variable, namely GDP, it is found that an increase of GDP value will increase the amount of FDI stock received by developing countries.

An increase in GDP is associated with bigger market, where this is most likely favored by

multinational companies seeking to expand their business (Broadman & Sun, 1997; Hufbauer, Lakdawalla, & Malani, 1994). This variable is directly related to economic growth, where one percent increase in GDP will increase the FDI stock. Although GDP growth does not directly translate to better purchasing power, GDP growth is important because it signals the continuous increase of economic performance.

For the next variable, GDP per capita, it is also found that an increase in GDP per capita will increase the amount of FDI stock. Any increase in GDP per capita is essentially linked to increasing purchasing power by the public, which is an essential factor in stimulating demands for industries. Further, trade openness is found to be significant. This implies that any increase in

the ratio to GDP will increase FDI stock inflows. Trade openness is a significant indicator about a country's role in international trade, which implies that the higher the ratio, a country is more open towards international trade (Liargovas & Skandalis, 2011; Rashid et al. 2017). It can be concluded that for the sample countries used in this analysis. macroeconomic indicators play an important role as FDI determinants.

For the four types of institutions, it is found that three institutions are significant while the other one is not. These three institutions are legal, bureaucratic, and economic institutions. Political institution is found to be insignificant. The three institutions are significant at 5% and 10% level of significance. Firstly, the quality of bureaucratic institution is significant with positive coefficient. Therefore, any increase in index score for bureaucratic institution of a country will increase the amount of FDI stock inflows received by a country. Nevertheless, several interesting results emerge from both legal and economic institutions. Both institutions are significant, albeit with negative coefficients. This result implies that decreasing index scores for both types of institution will bring higher FDI stock inflows for developing countries. This result will be discussed in depth in the next section.

3.2 Discussion

The result above will be discussed in depth in this section, especially for the independent variables outside the control variables. Therefore, this section will focus more on three forms of institution, namely bureaucratic, economic, and legal institutions. Simply explained, bureaucracy institution is understood as a set of formal rules and regulations that consist of procedures in order to ensure efficiency in both public and private organizations (Frâncu, 2015).

In terms of FDI, bureaucracy is measured by how lengthy the process is to attain permits or any other forms of license by foreign entities that are necessary to officially open a business in a country. Drabek and Payne (2002) explained that due to its lengthy nature, bureaucratic institution has the tendency to become highly inefficient. A

highly inefficient bureaucracy can bring several negative impacts, such as increasing the risk of corruption and it can impede FDI inflows because foreign entities might not want to engage with the lengthy process that is time-consuming (Drabek & Payne, 2002).

Therefore, it is necessary for countries to create a bureaucratic system that is efficient, including developing countries. An efficient bureaucratic system is equal to a better business climate that can either shorten the process or lower the chance of corruption. This can serve as a positive signal for investors (Jayasuriya, 2011). The result of this paper does support past research that have been conducted on the issue between bureaucracy and FDI, where more efficient bureaucratic institution translates to higher FDI inflows regardless of its country status be it developing or developed country. Past research such as Drabek and Payne (2002), Vogiatzoglou (2016), Campos and Kinoshita (2003) dan Bitzenis, Tsitouras, and Vlachos (2009) have all highlighted the importance of creating a bureaucratic system that is efficient to attract higher FDI inflows.

Nevertheless, an interesting discussion emerge for both economic and legal institutions. Both institutions, albeit statistically significant, have negative coefficients. Economic institution refers to the quality of financial institutions along with the efficiency goods and labor markets. Quality of financial institutions is often determined by two aspects, namely its access and depth that can be accessed by all parties including foreign entities without any noticeable hindrance. Further, the efficiency of goods and labor markets imply that the markets work efficiently to ensure healthy competition between local and foreign entities in a host country market (World Bank, 2018).

In its relation to FDI, economic institution with better quality is directly associated to innovation activities and increasing effort towards research and development (R&D) activities (Girma, Gong, & Görg, 2008). This is associated with the fact that a firm which receives capital injection by economic institution is able to directly

face financial constraint that is a barrier in innovation. Further, a good economic institution will encourage healthy competition between local and foreign entities, such as preventing the domination of foreign entities and to prevent cornering the market for skilled workers (Farole, Winkler, & Oliver, 2013).

Therefore, the negative coefficient in the regression output can be interpreted in two ways. Firstly, multinational or any foreign entities investing in ASEAN's developing countries are not driving either innovation activities or R&D. Foreign entities operating in these developing countries are most likely to be active in sectors that do not require sophisticated technology, such as manufacturing industry.

Manufacturing industry, that mostly focuses on semi-finished and finished goods, typically does not require sophisticated technology due to its low added value unlike industries that heavily rely on R&D. Further, these types of industry in developing countries are still heavily dominated by labor-intensive industries (Antràs, 2020; World Bank; 2020).

Secondly, the inflows of FDI stock towards developing countries have a high potential to crowd out investments made by local companies. The phenomenon of crowding out investments might occur because foreign entities that enter the developing countries have technological superiority that firms in developing countries do not or have not possessed. Therefore, there is a high chance that foreign companies may end up dominating local companies.

This can cause several negative impacts, such as absence of technological transfer that is expected and the inability of local firms to compete with foreign firms that can drive local firms out of the market hence creating an unhealthy competition (Agosin & Machado, 2005; Farole, Winkler, & Oliver, 2013). Further, FDI is not encouraging any formation of local capital that should be beneficial for economic development, a final result that is presumed by scholars. This finding is similar with past research such as Agosin and Machado (2005) and Barrios, Görg, and Strobl (2005).

Similar with economic institution, legal institution is also significant albeit with negative coefficient. This result is quite surprising as it does not confirm past research on the role of legal institution in attracting FDI. Legal institution is associated with weak implementation of law, more prone to contract breach, and weak intellectual property protection (Jensen, 2008; Li, 2009). A strong legal institution is necessary in order to constrain and prevent such risks from happening.

According to the regression result, it can be concluded that FDI stock inflows towards developing countries will increase as the quality of legal institution becomes worse. This arguably implies that foreign companies take advantage of the lower quality of legal institution in developing countries. This revelation can be interpreted in several ways, firstly, foreign companies investing in ASEAN's developing countries are not concerned with the entailing risks that emerge from lower quality legal institutions.

It can be argued that foreign companies which invest in developing countries are taking advantage of developing countries' weaker law enforcements for their own benefits and gains (Bhasin & Garg, 2019). This result might suggest that these foreign firms are engaging in practices such as natural resource or labor-intensive manufacturing industries that are often linked to exploitation which is a common phenomenon in developing countries due to its weak law enforcement (Sumner, 2008; Arslan; 2020).

Secondly, this finding is intertwined with the previous finding, where the results highly suggest that FDI inflows towards developing countries are not encouraging high-quality investments. It has been explained in the previous paragraphs that legal institution plays an important part in protecting any forms of intellectual property which is necessary for foreign investors (Staat & Biglaiser, 2012). Both the results from economic and legal institution suggest that the quality of FDI in developing countries is low and does not support innovation as indicated by the negative coefficients of the regression result. This result does support Bhasin and Garg's research (2019) but does not support Staats and Biglaiser's

Jurnal Ekonomi Pembangunan: Kajian Masalah Ekonomi dan Pembangunan, 22 (2), 2021, 161-180 (2012), Ali et al (2010), and Bissoon's (2012). Nevertheless, it should be noted that the past research only focused on single aspect of rule of law, which might produce different result with the authors.

Therefore, while it is true that institutions will help reducing risks and uncertainty, it only applies to bureaucratic institution but not to either economic or legal institutions. The results suggest that the type of FDI stock inflows into developing countries can be categorized as low-quality investments. Further, the points elaborated in the previous paragraphs suggest that FDI inflows in developing countries have the potential to crowd out domestic investments. This might be harmful for developing countries in the long run because it does not support local economic development as proposed by proponents of FDI.

4. Conclusion

The purpose of this paper is to investigate whether institutional quality matters for FDI stock inflows in developing countries. In order to achieve the aforementioned purpose, the authors constructed four indices that represent quality of institutions in a country, which is divided into legal, bureaucratic, economic, and political institutions. The result highlighted the fact that three out of four institutions matter for FDI stock inflows.

The findings of this research do not wholly support the result of past research. While past research all acknowledges that increasing the quality of institutions is a prerequisite to attract more FDI inflows, the results obtained from this paper suggest that lower quality of economic and legal institutions encourage more FDI stock inflows. Therefore, it can be concluded that the quality of FDI inflows towards developing countries is categorized as low quality, which does not support local investment, with high risk of exploitation, and no support for innovation.

This finding poses a challenge for developing countries in ASEAN because it can encourage developing countries to lower their institutional quality, especially economic and legal institutions, to attract more FDI stocks. While FDI does bring

a lot of attractive benefits, it shall be agreed that the quality of FDI is more important than the quantity of FDI. This will be beneficial for developing countries in the long-run, as good quality FDI will help developing countries to attain the benefits such as technological transfer and more skilled labors.

Nevertheless, this research also has its limitations. Firstly, due to the limited availability of data, the authors cannot include Myanmar in the analysis that could enrich the analysis even further. Secondly, due to the usage of PCA, the authors cannot look at the independent variables individually to give a more detailed result. Thirdly, this paper does not focus on normative institutions due to the limited availability of data. The future research may include this kind of institution to enrich the analysis.

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6. Appendixes

Appendix 1 Correlation Matrix

	FDI Stock	GDP	GDP CAP	OPEN	GROWTH	INS_LEGAL	INS_BUREAU	INS_POL	INS_ECON
FDI Stock	1.00								
GDP	0.74	1.00							
GDP CAP	-0.31	-0.25	1.00						
OPEN	0.13	-0.28	0.02	1.00					
GROWTH	0.18	0.01	-0.74	-0.01	1.00				
INS_LEGAL	-0.43	-0.39	-0.10	-0.40	0.30	1.00			
INS_BUREAU	-0.16	-0.27	-0.37	-0.16	0.51	0.72	1.00		
INS_POL	0.15	0.25	-0.29	-0.42	0.40	0.65	0.49	1.00	
INS_ECON	0.03	0.07	0.62	0.29	-0.64	-0.43	-0.36	-0.29	1.00

Appendix 2 Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
FDI Stock	56	.3075	.2749562	0	1
GDP	56	.2526786	.2752618	0	1
GDP_CAP	56	.1585714	.2402228	0	1

Variable	Obs	Mean	Std. Dev.	Min	Max
GROWTH	56	.7092857	.2461622	0	1
OPEN	56	.3733929	.2809094	0	1
INS_LEGAL	56	.8882143	.4200394	0.28	1.69
INS_BUREAUCRACY	56	1.10375	.3410815	0.52	1.79
INS_POLITICAL	56	.9841071	.4676703	0.3	1.8
INS_ECONOMIC	56	.7244643	.2643615	0.4	1.27