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Growth Effect of Foreign Direct Investment in Asean Economies: Does Institutional Quality Matter?

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Abstract. *This paper empirically studies how foreign direct investment affects economic growth and how this effect depends on institutional quality. Using threshold regression analysis on panel data for nine ASEAN countries from 2002 to 2020, the estimated results indicate a nonlinear impact of foreign direct investment on growth across various institutional regimes. When the institutional quality falls below the threshold value, foreign direct investment has a negative effect on growth. However, when institutional quality exceeds this value, foreign direct investment contributes positively to economic growth. In particular, we observe that FDI facilitates economic growth in most ASEAN countries when institutional quality is above the threshold value, except for Laos. This finding emphasizes that institutional quality significantly influences the effectiveness of foreign direct investment on economic growth. Based on the research findings, we propose several policy implications to improve institutional quality in ASEAN countries to enhance the positive impact of foreign direct investment on the economy.*

Keywords: *FDI, economic growth, institutional quality, threshold, ASEAN*

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Introduction

The importance of FDI has been growing in many countries worldwide, given its potential and tangible benefits for EG, including job creation, technology transfer, enhanced efficiency, competitiveness, complementing domestic savings, and integration into the global economy. FDI contributes to augmenting the existing knowledge in the host country by transferring managerial and organizational skills. It also promotes domestic firms' adoption of more advanced technologies through capital accumulation. FDI enterprises help expand export markets and stimulate domestic investment through technology spillover, leading to increased productivity. Consequently, FDI has become a primary tool for promoting EG in developing countries. However, the benefits of FDI are not evenly distributed among different segments of society, potentially exacerbating income inequality and leaving certain population groups vulnerable to being left behind.

The empirical evidence on the impact of FDI on EG is inconclusive. Most studies indicate a positive impact of FDI on EG (Abouelfarag & Abed, 2019; Chaudhury et al., 2020; Ciobanu, 2020; Cung, 2019, 2020; Cung et al., 2021; Hayat, 2018; Mowlaei, 2018; Nantharath & Kang, 2019; Zekarias, 2016; Ateik et al., 2023; Raihan, 2024), while others report the opposite (Mohamed et al., 2013; Curwin & Mahutga, 2014; Temiz & Gokmen, 2014; Arif et al., 2017; Mawutor et al., 2023). FDI may exert adverse effects on domestic growth by crowding out domestic investment, as domestic enterprises encounter challenges competing with their foreign counterparts (Avci & Akin, 2020; Jude, 2019). However, studies by Aitken and Harrison (1999), Belloumi (2014), Debbiche (2020), and Le et al. (2021) found no independent relationship between FDI inflows and EG or insignificant effect of FDI on EG (Ehigiamusoe & Lean, 2019). The impact of FDI on the host country's economy depends on various factors such as absorptive capacity on human capital, infrastructure (Le et al., 2021), industry structure (Chaudhury et al., 2020), natural resources (Hayat, 2018; Shinwari et al., 2023), financial development (Abdul Bahri et al., 2019; Nguyen, 2022; Osei & Kim, 2020), and the institutional quality (Durham, 2004; Meyer & Sinani, 2009; Jude & Levieuge, 2016; Miao et al., 2020; Van Bon, 2019).

The ambiguous nature of the FDI–Growth relationship has prompted this study to focus on the role of institutions. Institutions can be broadly defined as the frameworks that govern social relationships, shape individual and collective behaviors, and regulate the functioning of societies. Institutions shape a nation's productivity and may therefore attract more FDI inflow; conversely, weak institutions can increase the cost of doing business and hinder FDI activity, thereby affecting economic growth (Tun et al, 2014). Institutional quality, in particular, reflects the effectiveness, efficiency, and integrity of these frameworks in guiding political, economic, and social interactions. Effectiveness refers to the capacity of institutions to achieve their intended objectives, such as implementing policies that foster economic development. Efficiency emphasizes the

optimal use of resources in achieving these objectives, minimizing waste and delays. Integrity underscores adherence to principles such as transparency, accountability, and the rule of law, which ensure fairness and build public trust in institutional processes. Together, these dimensions enable institutions to effectively mediate social, political, and economic interactions, thus enhancing the potential benefits of FDI. High-quality institutions are characterized by attributes such as strong rule of law, transparency, accountability, effective control of corruption, and the ability to foster an environment conducive to economic growth and social well-being. As such, institutional quality plays a pivotal role in shaping the success of governance, the implementation of economic policies, and broader developmental outcomes (Hayat, 2019).

Recent literature emphasizes the role of good governance and a conducive institutional environment in promoting sustainable economic growth and development (Verspagen, 2012; Acemoglu et al., 2019; Haggard & Tiede, 2020; Ho & My-Linh, 2023). Many previous studies have explored the FDI–growth relationship but have yet to examine the impact of institutional quality, especially in ASEAN countries. Rare prior research has focused on the threshold level of institutional quality and examined the nonlinear impact of FDI on EG under different institutional conditions in the ASEAN region.

The ASEAN region comprises 11 countries in Southeast Asia. As an emerging market, ASEAN has attracted substantial FDI inflows. FDI into ASEAN countries increased from USD 105.2 billion in 2011 to USD 224.2 billion in 2022, accompanied by a rise in the average GDP growth rate from 5% in 2011 to 5.7% in 2022[1]. The region's share of global FDI soared after the 2008 global financial crisis and accelerated amid the U.S.–China trade tensions. In 2022, ASEAN attracted a record-high nearly 17% of global FDI. Policies such as the ASEAN Free Trade Area and the ASEAN Investment Area have enhanced ASEAN's competitiveness in attracting FDI.

Moreover, policy frameworks of regional countries identify investment as a vital factor in their comprehensive economic integration efforts. ASEAN's primary goal in the investment domain is to further enhance the region's attractiveness as a global investment destination by establishing an open, transparent investment regime. Additionally, many ASEAN countries have implemented economic policies to attract FDI, including economic reforms, investment-friendly environments, privatization of state-owned enterprises, macroeconomic stability through inflation control and budget deficit management, legal reforms to improve FDI frameworks, trade liberalization, and improvements in legal frameworks, telecommunications infrastructure, … and various other areas (UNCTAD, 1999). It implies that the ASEAN region mainly focuses on policy improvements to harness the impact of FDI on the economy effectively. However, despite these reforms, most ASEAN countries, being developing nations, often encounter obstacles such as political system issues, low labor quality force, lack of transparency,

[1] Authors' calculations are based on data collected from the World Bank.

and low enforcement efficiency of regulations (Arayssi, 2020). In theory, a country with weak institutions, low government efficiency, and high corruption may hinder the positive effects of FDI on the economy. However, there is a lack of empirical research examining the institutional environment's role in attracting FDI and promoting the effect of FDI on economic growth in this region to explain the difference in the effective use of FDI capital and propose policy implications for countries in the region.

This study aims to evaluate the role of institutional quality in the effectiveness of the impact of FDI on growth in ASEAN countries. According to this, we seek answers to the following questions: (RQ_1) How does FDI impact EG in ASEAN countries?; (RQ_2) What is the role of institutional quality in the FDI-growth relationship in the ASEAN region? ; (RQ_3) Is there a threshold level of institutional quality that changes the impact of FDI on growth in ASEAN countries? Addressing these questions is crucial for scholars and policymakers, providing an economic foundation for future policies to attract FDI into ASEAN reasonably and efficiently, leveraging the positive effects of FDI on regional growth.

Following the introduction, the remainder of the article is structured as follows: Section two provides an overview of theoretical and empirical literature relevant to the topic. Section three presents the research methodology, including data, models, and estimation methods. Section four presents the experimental results and discussion. The final section concludes the study and provides policy recommendations.

2. Literature Review

2.1 Effect of FDI on EG

The Solow growth model explains long-term EG based on exogenous factors, including capital accumulation, labor, and technological progress (Solow, 1956). Solow's exogenous growth theory emphasizes that technological progress is the main determinant for sustainable growth and international productivity differentials. This theory clarifies the impact of FDI on economic growth through its influence on domestic investment. Specifically, FDI inflows into countries help supplement domestic capital, contribute to the capital accumulation process, and foster economic growth (Herzer et al., 2008). Stokey (1988) expands the Solow growth model by introducing human capital and emphasizing the role of learning-by-doing in economic growth. FDI brings technology, expertise, and capital, helping local workers and firms improve skills and productivity through spillover effects (Gorg & Greenaway, 2004).

Romer's endogenous growth theory asserts the role of internal factors in affecting the return on investment and contends that technological progress is not the sole condition for sustainable growth (Romer, 1989). This theory underscores that the EG rate of a country directly depends on the value of human capital through the assimilation of new knowledge. Through FDI activities, advanced production technology,

management experience, and market access are transferred from the investing country to the host country. As a result, labor skills are enhanced, increasing labor productivity and fostering production growth (Blomström & Kokko, 1997; Borensztein et al., 1998). Furthermore, endogenous growth theory (Romer, 1989) also supports the idea that the productivity of domestic firms increases through the spillover effects of FDI, thereby promoting economic development (Grossman & Helpman, 1991; Liu & Zou, 2008). Specifically, the spillover effect occurs when the presence of FDI firms in the host country exerts pressure on domestic firms to enhance their technology and improve management capabilities to augment competitive capacity, fostering growth and development.

Numerous studies have been conducted to assess the impact of FDI on EG; however, the results of these studies are inconsistent. Kaukab (2023) conducted a meta-study on the factors influencing FDI and its impact on the economies of countries. Based on the analysis of 31 meta-studies on FDI, covering 500 to 2,874 studies from 1960 to 2020, the author found that, among macro-level studies, 44% of the studies report a positive impact of FDI on economic growth and macroeconomic factors, while 12% of the studies show a negative impact, and the remaining 44% find no significant impact of FDI. In contrast, among micro-level studies, 39% found no significant impact and 11% reported a negative impact. Kaukab (2023) concluded that this inconsistency emphasizes the need for further research, particularly in the context of developing countries. Most studies have found evidence of a positive impact of FDI on growth through spillover effects, such as technological improvements, increased labor skills, or management expertise (Omri & Kahouli, 2014; Iamsiraroj & Ulubaşoğlu, 2015; Pegkas, 2015; Biørn & Han, 2017; Abouelfarag & Abed, 2019; Chaudhury et al., 2020; Ciobanu, 2020; Cung, 2019, 2020; Cung et al., 2021; Hayat, 2018; Mowlaei, 2018; Nantharath & Kang, 2019; Zekarias, 2016). Conversely, some studies have identified negative effects of FDI on EG, arguing that FDI displaces domestic investment and generates excessive profits for the host country (Barry et al., 2005; Ang, 2009; Ahmed, 2012; Mohamed et al., 2013; Curwin & Mahutga, 2014; Temiz & Gokmen, 2014; Arif et al., 2017). However, some studies have found no significant impact of FDI on EG (Karimi & Yusop, 2009; Belloumi, 2014; Debbiche, 2020; Ehigiamusoe & Lean, 2019; Le et al., 2021).

2.2 Effect of Institutional Quality on the Effectiveness of FDI on EG

FDI promotes EG in the host country through various channels, such as capital accumulation in the exogenous growth theory and technology and knowledge spillovers in the endogenous growth theory. Institutions can affect the relationship between FDI and EG through various dimensions of FDI.

FDI's first and most crucial impact on EG is its role in enhancing the spillover effects of technology and knowledge. It is the primary channel through which institutional quality influences the effectiveness of FDI on EG. Institutions directly influence the

scale, quantity, and quality of FDI projects, subsequently affecting the effectiveness of FDI in driving EG. A country with strong institutions, including a sound legal framework, effective law enforcement, and governance, with low corruption levels, creates an environment of fair and competitive investment protected by market regulations, which reduces "hidden costs". These attract more investors, resulting in increased FDI. Additionally, it allows the host country to select high-tech FDI inflows with the potential to boost growth, thus generating more positive spillover effects. Conversely, a country with weak institutions often increases risks for investors, escalates hidden costs, leading to the consequence of reduced attractiveness for investors, or attracts low-tech FDI with low productivity, primarily exploiting local resources and posing a high environmental pollution risk (Mabey & Mcnally, 1999).

Additionally, FDI activities stimulate domestic competition. It is the next channel through which institutions can influence the effectiveness of FDI on EG. Quality and effective institutional frameworks incentivize domestic firms to compete with foreign firms. It directly affects the technology transfer process and the dissemination of knowledge, increasing domestic firms' productivity and promoting the spillover effects of FDI (Brahim & Rachdi, 2014; Meyer & Sinani, 2009).

Based on the arguments above, this study anticipates that the relationship between FDI and growth will depend on the institutional quality of ASEAN countries. Specifically, high institutional quality also contributes to the growth generated by FDI through enhanced spillover effects, increased competition, and capital accumulation in these countries.

Many empirical studies have demonstrated that institutional quality is one of the decisive factors affecting the effectiveness of FDI on EG (Alguacil et al., 2011; Tun et al., 2014; Adeleke, 2014; Miao et al., 2020; Van Bon, 2019; Ho et al., 2024). Institutional quality can enhance the positive effects that FDI brings to the economy, but it can also hinder or negatively impact the effectiveness of FDI on EG. Jude and Levieuge (2016) emphasized that a certain level of institutional development is a prerequisite to realize the growth-promoting effects of FDI. Similarly, many other studies have found a positive correlation between institutional quality and the effectiveness of FDI on EG (Hsiao & Shen, 2003; Rachdi & Brahim, 2014; Jilenga & Helian, 2017; Miao et al., 2020; Van Bon, 2019). Most of these studies have provided evidence that countries with higher institutional quality and better governance can harness FDI advantages more effectively, resulting in a more significant positive impact on EG than countries with lower governance scores or poorer institutional quality.

Recently, Aziz (2020) discovered that institutional quality plays a vital role in promoting EG through indirect effects by absorbing the spillover effects of FDI in 11 Arab countries during 1988–2012. Examining the direct impact of institutions in attracting Chinese FDI to sub-Saharan African countries, Miao et al. (2020) found that the positive effects of FDI on EG significantly depend on appropriate policy actions to improve the institutional quality of these countries. However, some studies have found adverse

effects of institutions on the correlation between FDI and EG (Smith, 2007). Asamoah et al. (2019) did not find any significant evidence of the role of institutional quality in influencing the effectiveness of FDI on EG in 34 sub-Saharan African countries.

Several studies examining the role of institutions in the relationship between FDI and EG have identified a threshold value for the institutional quality that host countries need to achieve to improve the effectiveness of FDI on EG. Using panel data from 130 countries during 1995–2008, Okada and Samreth (2014) asserted that the interaction between FDI and corruption positively impacts FDI's effect on EG. More specifically, FDI harms EG if corruption is below a certain threshold. Similarly, Jude and Levieuge (2016) found that a favorable institutional environment positively impacts and enhances the effectiveness of FDI in promoting EG. Simultaneously, the study identified a threshold value of institutional quality that affects the FDI–growth relationship. Recently, Kondyan and Yenokyan (2019) used a GMM model for five regions (SSA, MENA, Europe, Asia, and the Americas) and confirmed institutions' significant role and influence in the overall impact of FDI on improving EG. Notably, when examining individual components of institutions, the study determined a stable threshold for government stability and the effectiveness of legal enforcement in driving GDP growth through FDI.

Contrary to most studies, which rely on overall institutional indices to assess the role of institutions in the FDI-EG relationship, Yeboua (2021) analyzed the impact of each aspect of institutions on the FDI–growth correlation in 27 African countries during 1990–2017. The results showed that FDI promotes EG in countries with institutional quality above a specific threshold. For countries with institutional quality below this threshold, FDI negatively or neutrally impacts EG. Specifically, countries need to exceed thresholds of 65% for government stability, 50% for voice and accountability, 45% for rule of law, 35% for control of corruption, and 25% for administrative machinery quality to benefit from FDI's impact on EG.

Although many studies investigated the correlation between FDI, EG, and institutions in the ASEAN region, most have only examined the mutual relationship between two factors: FDI and EG, FDI and institutions, or institutions and EG. Few studies explore the impact of institutional quality on the effectiveness of FDI in EG. Furthermore, to the authors' knowledge, there is no study to determine the threshold value of institutional quality in evaluating the impact of FDI on EG in ASEAN countries. Through this research, the authors aim to supplement the theoretical framework of the effects of FDI on EG under the influence of institutional quality and identify a specific threshold value of institutional quality to provide a more precise assessment of the impact of FDI on EG before and after the threshold. The results of this study serve as a basis for policymakers to propose appropriate solutions to enhance the positive effects brought by FDI.

3. Data and Methodology

3.1 Data

We collected the data for this study from reliable sources, including the World Development Indicators (WDI), and the Worldwide Governance Indicators (WGI) for 9 ASEAN countries (Singapore, Indonesia, Malaysia, Thailand, Vietnam, Brunei, Philippines, Cambodia, and Laos). The data covers the annual period from 2002 to 2020, as the WGI dataset is available annually from 2002 onwards.

Table 1

Research Variables

Variable	Abbreviation	Description	Source
Economic growth	LGDP	Natural logarithm of GDP per capita (current US$)	WDI
Foreign direct investment	FDI	Net inflow of FDI (% of GDP)	WDI
Institutional quality	IQ	PCA 6 factors of WGI	WGI
Government expenditure	GCE	General government final consumption expenditure (% of GDP)	WDI
Trade openness	TRADE	Trade (% of GDP)	WDI
Inflation	INF	Change in annual consumer price (%)	WDI
Labor force	LF	Natural logarithm of total labor force	WDI

3.2 Methodology

3.2.1 Non-threshold estimation

Although our main aim is to perform a threshold analysis of the FDI-growth relationship, we initially start with a non-threshold analysis. We examine the institutional channel of foreign direct investment in the ASEAN region through which FDI affects growth. To do this, we interact FDI with IQ and use the resulting interaction term as a regressor to determine the importance of IQ in unleashing the growth benefits of FDI. To ensure the interaction term does not represent FDI, we follow Alfaro et al. (2004) and include FDI as an independent regressor. The regression is given as follows:

$$LGDP_{it} = \mu_{it} + \gamma LGDP_{i,t-1} + \alpha FDI_{it} + \beta(FDI^{*}IQ)_{it} + \theta Z_{it} + \varepsilon_{it} \qquad \text{(Model 1)}$$

In the above model, we used the logarithm of GDP per capita instead of the GDP growth rate as a dependent variable due to its ability to reduce data asymmetry. Moreover, the logarithm of GDP per capita better reflects living standards and long-term economic accumulation. This approach also allows for more effective comparisons of development levels across countries and minimizes the influence of outliers. It is worth noting that a significant body of previous research has also employed the logarithm of

GDP per capita as a representation of economic growth, underscoring its widespread acceptance and utility in economic modeling (Barro, 1991; Arellano & Bond, 1991; Mankiw et al., 1992; Blundell & Bond, 1998; Acemoglu et al., 2001).

Since the economic performance outcomes in any given year are typically influenced by the macroeconomic conditions and economic policies in the preceding years, we added the 1st-order lag of the dependent variable (LGDP) into Model (1). Adding the 1st-order lag of the LGDP variable to the growth regression equation is necessary to capture the dependence of current economic growth on past growth, control for autocorrelation, and account for the lingering effects of economic shocks. Autocorrelation arises when the model's errors depend on each other over time, resulting in inefficient estimates. The lagged explanatory variable helps minimize this phenomenon by capturing the temporal dependence of the dependent variable, thereby reducing the correlation between errors (Blundell & Bond, 1998). Furthermore, the inclusion of the lagged variable in the model is a key step in addressing the issue of potential endogeneity. Endogeneity, a situation where there is a correlation between the error term and explanatory variables, can lead to biased estimates. The lagged variable plays a crucial role in controlling for unobserved factors that may simultaneously affect both the independent and dependent variables in the present (Arellano & Bond, 1991). This makes the model more accurate and stable, providing more reliable estimation results and forecasts.

The coefficients are obtained using a panel data estimator. There are different methods to estimate models with panel data. Panel data regression can be calculated using the Pooled Ordinary Least Squares (Pooled OLS), Fixed Effects Model (FEM), and Random Effects Model (REM). While the Pooled OLS model is widely used as a benchmark in panel data regression, the choice between FEM and REM is often based on the Hausman test (Baltagi, 2005; Gujarati, 2004). Because each estimation method has its value, we conduct pre-regression tests and use different tests to select the most appropriate estimation method for the research data: the F-test (to choose between Pooled OLS and FEM), the Breusch-Pagan Lagrangian test (to select between Pooled OLS and REM), and the Hausman test (to select between FEM and REM). After estimating the research model using the chosen approach, we test for its defects and propose using Feasible Generalized Least Squares (FGLS) to address these defects. α is the unconditional marginal effect of FDI_{it} on $LGDP_{it}$, the condition being $IQ_{it} = 0 \; \forall i;t$. The overall conditional marginal effect of FDI_{it} on $LGDP_{it}$ is denoted by:

$$\frac{\partial LGDP_{it}}{\partial FDI_{it}} = \alpha + \beta IQ_{it} .$$

3.2.2 Threshold estimation

A major restriction posed by the preceding empirical analysis, the non-threshold analysis, is the assumption of global linearity or monotonicity of the impact of FDI

on growth in the growth regression models. Alfaro et al. (2004) and Bornstein et al. (1998) suggest that one possible reason for the discrepancy in results might be the imposition of a globally linear model on an inherently nonlinear relationship. A possible nature of the nonlinear relationship is that there exists at least one value of at least one of the explanatory variables in the regression equation such that the link between FDI and growth changes below or above this value. In this section, we use the threshold regression analysis to address this concern.

The threshold framework provides a more generalized and flexible specification as it accommodates several possibilities of FDI–growth relationships for different values of the thresholds. It allows relationships between FDI and growth to be piecewise, not necessarily globally linear, with the threshold variables acting as a regime-switching trigger. We use this framework to analyze the impact of FDI on economic growth in ASEAN countries, without the usual restrictions posed by the assumption of global linearity. The central hypothesis is that there are threshold effects in the FDI–growth nexus; that is, certain values of the institutional quality alter the relationship between FDI and economic growth.

To test the hypothesis on the threshold effect of institutional quality on the effectiveness of FDI's impact on EG, we employ the threshold regression method proposed by Hansen (1999) and refined by Wang (2015) using Model (2) as follows:

$$LGDP_{it} = \mu_{it} + \gamma LGDP_{i,t-1} + \beta_1 FDI_{it}\, I(IQ_{it} \le \gamma) + \beta_2\, FDI_{it}\, I(IQ_{it} > \gamma) + \\ + \phi Z_{it} + \varepsilon_{it} \qquad \text{(Model 2)}$$

in which $i = 1, \ldots, 9$ and $t = 2002, \ldots, 2020$; institutional quality (IQ) is the threshold variable, and FDI is the regime dependent regressor. γ represents the threshold value of institutional quality. I is an indicator function of the threshold variable. The threshold variable IQ_{it} divides the sample into regimes whose regression parameters exhibit different slopes β_1 and β_2. Z_{it} is a vector of explanatory variables that can be divided into a subset of exogenous variables, including government expenditure (% GDP), labor force (LF), trade openness (TRADE), and inflation (INF). ε_{it} is the error term.

For estimation, Model (2) is divided into two groups – one in which the threshold variable exceeds the threshold value and the other in which the threshold variable falls below the threshold value. On this basis, the data samples were also divided into two groups. The slope coefficients associated with each group are then determined. The prior expectation for each threshold parameter is as follows: FDI is expected to accelerate (weaken) growth when institutional quality is above (below) their estimated threshold level. The subsamples obtained when each threshold variable is greater (smaller) than its estimated threshold value represent the high (low) regime. In other words, low and high regimes, a classification due to Hansen (1999), represent samples divided based on estimated threshold values. They represent the subsamples obtained when the observed threshold variables are below and above their estimated threshold values. Ac-

cording to Hansen (2000) and Caner and Hansen (2004), the critical values used to obtain the 95 percent confidence interval of the threshold value are given by $\Gamma = \{\gamma^a : LR(\gamma^a) \leq c(a)\}$, where $c(a)$ is the 95th percentile of the asymptotic distribution of the likelihood ratio statistic $LR(\gamma^a)$.

Based on Model (2), we formulate the following hypotheses:

H_0: $\beta_1 = \beta_2$

H_1: $\beta_1 \neq \beta_2$

If the null hypothesis H_0 is rejected, it implies that $\beta_1 \neq \beta_2$ and the threshold value (γ) exists. This will happen if the p-value is less than the significance level. It implies no difference in the impact of FDI on EG in different institutional contexts, suggesting a linear effect.

4. Results and Discussion

4.1 Descriptive Statistics

The results of descriptive statistics in Table 2 reveal that the average FDI inflow into the countries accounted for more than 5.81% of total GDP during the period 2002–2020. Among these, Singapore has the most significant FDI inflow, representing 32.17% of its GDP in 2019. Regarding institutional quality, the average Composite Institutional Quality Index (IQ) holds a negative value of (-0.0907). It indicates that most of the sampled countries in the study exhibit relatively low to average institutional quality. This result can be explained by the fact that most ASEAN countries are developing nations characterized by institutional deficiencies and relatively high political risk.

Table 2

Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
LGDP	171	8.33	1.43	5.77	11.11
FDI	171	5.81	6.40	-1.32	32.17
GCE	171	11.44	5.17	3.46	27.17
TRADE	171	137.48	90.93	33.19	437.33
INF	171	3.62	3.90	-2.32	24.10
LLF	171	16.17	1.86	12.02	18.73
IQ	171	-0.09	0.72	-1.21	1.57

4.2 Non-threshold Estimation

Model selection. To choose the most appropriate model for panel data, the authors employed various tests, including the F-test to select between the Pooled OLS and FEM models, the Breusch-Pagan Lagrangian test to choose between Pooled OLS and REM, and the Hausman test to select between FEM and REM.

Table 3

Results of Regression Model Selection _ OLS, FEM, REM

Test	Result	Conclusion
F Test	$F(8, 146) = 3.66^{***}$	**FEM**
Breusch And Pagan Lagrangian Multiplier Test	$\chi^2_1 = 0.00$	
Hausman Test	$\chi^2_7 = 14.61^{**}$	

Note. **,*** correspond to the level of statistical significance at 5%, 1%.

The results in Table 3 confirm that the Fixed Effects Model (FEM) is the most efficient model for the research dataset. However, to ensure the model's suitability, we tested for its defects, including autocorrelation and heteroskedasticity, using the Wooldridge and Wald tests.

Table 4

Results of Wooldridge and Wald Tests

Test	Result	Conclusion
Woolridge Test	$F(1,8) = 102.146^{***}$	**Autocorrelation**
Wald Test	$\chi^2_9 = 2{,}256.45^{***}$	**Heteroskedasticity**

Note. *** corresponds to the level of statistical significance at 1%.

The results of the model weaknesses tests in Table 4 provide evidence of autocorrelation and heteroskedasticity at a 1% significance level. These defects can lead to unreliable regression coefficients in terms of statistical significance, resulting in biased model outcomes. Consequently, we applied the Feasible Generalized Least Squares (FGLS) estimation method to address these defects.

4.3 Results of FGLS Estimation

The estimation results from the FGLS model in Table 5 show that macroeconomic variables, including FDI, trade openness, labor force, and inflation rate, all positively impact EG. However, government expenditure shows a significantly negative effect. Furthermore, past GDP growth rate is the foundation for current GDP growth with a statistical significance of 1%.

Table 5

Results of FGLS Estimation

Variables	Coefficient	Std. deviation	P_value
L.LGDP	0.9751***	0.0060	0.000
FDI	0.0002	0.0011	0.866
D.GCE	-0.0309***	0.0047	0.000
D.TRADE	0.0005*	0.0003	0.086
D.LLF	0.4787*	0.2617	0.067
INF	0.0060***	0.0009	0.000
*FDI*IQ*	0.0020**	0.0008	0.018
Constant	0.2378***	0.0497	0.000

Note. *, **, *** correspond to the level of statistical significance at 10%, 5% and 1%.

The results in Table 5 show the impact of FDI on growth through the role of institutional quality in ASEAN countries. Corresponding to the first research question (RQ_1), FDI appears to have a positive relationship with growth in ASEAN, but this relationship is not strong in terms of statistical evidence. We explain this by suggesting that the impact of FDI on growth may be nonlinear, meaning that FDI only positively affects economic growth when it reaches a certain threshold or under specific conditions. If the analytical model assumes a linear relationship without considering the possibility of nonlinearity, the statistical results may fail to capture the impact of FDI. Furthermore, it is possible that the growth impact of FDI depends on foundational conditions. FDI may only have a positive effect on economic growth under certain conditions, such as strong institutional environments, political stability, or developed infrastructure. If these conditions are not met, FDI may not produce a significant impact. Our arguments are supported by the results regarding the interaction effects of FDI and institutional quality on growth, and the threshold model estimates.

The main result for the second research question (RQ_2) is that the interaction term (FDI*IQ) positively impacts growth. It indicates that improving the institutional quality enhanced the attractiveness of FDI inflows and promoted positive spillover effects from FDI to the economy in ASEAN. These findings align with the research of Hsiao and Shen (2003), Rachdi and Brahim (2014), Raheem (2014), Hayat (2019), and Aziz (2020).

A country with a good institutional quality, including effective corruption control, high legal compliance, assured accountability, and political stability, can mitigate costs and risks for investors and enhance trust in the government, attracting more FDI and contributing to EG. Conversely, a country with poor institutional quality or inefficient corruption control becomes a barrier to FDI inflows. It erodes foreign investors' trust and increases the cost and risk associated with investment activities, reducing market transparency and competitiveness, leading to inefficient resource allocation and causing economic damage. Institutional quality in ASEAN countries is essential as an attraction factor for FDI inflows and a driver of EG.

4.4 Threshold Estimation

To answer the third research question (RQ_3) and determine the threshold value of institutional quality, we utilize the threshold regression model proposed by Hansen (1999) and adjusted by Wang (2015). The results are presented in Table 6 below. The first section of the table displays the threshold variables, their estimated threshold values and the corresponding 95 percent confidence interval. The second section shows the regime-dependent coefficients of FDI on growth. In particular, $IQ < \hat{\gamma}$ and $IQ > \hat{\gamma}$ represent low and high threshold regimes, respectively, while $\widehat{\beta_1}$ and $\widehat{\beta_2}$ denote the effects of FDI on growth in the low and high threshold regimes. The third section shows the impact of the control variables on growth.

Table 6

Results of the Threshold Estimation

Threshold estimator (level = 95)			
$\hat{\gamma}$	-1.1030**	(-1.1498; -1.0313)	
Impact on variables			
	Coefficient	Std. deviation	P_value
FDI			
$\widehat{\beta_1}$	-0.1062**	0.0528	0.046
$\widehat{\beta_2}$	0.0063***	0.0021	0.003
Other variables			
L.LGDP	0.9226***	0.0133	0.000
D.GCE	-0.0303***	0.0042	0.000
D.TRADE	0.0005	0.0004	0.278
D.LLF	0.6190*	0.3626	0.090
INF	0.0049***	0.0018	0.007
Constant	0.654644***	0.1113	0.000

Note. *,**, *** correspond to the level of statistical significance at 10%, 5% and 1%.

We intend to ascertain whether the relationship between FDI and growth is altered when the institutional quality exceeds or falls below its estimated threshold values. Particularly, we aim to determine how different threshold levels of IQ might change the relationships between FDI and growth. The results indicate an institutional threshold value of γ = -1.1030 with 95% confidence. This threshold value divides the sample data into two groups based on institutional quality, falling within the ranges [-2.5; -1.1030) and [-1.1030; 2.5]. Specifically, in the lower threshold region, the coefficient of the FDI variable has a negative value at a 10% significance level, indicating an adverse impact on EG. Conversely, in the upper threshold region, the FDI coefficient has a positive value at a 1% significance level, demonstrating a positive impact on EG. This seems to suggest that countries with high institutional quality are much better able to reap the positive benefits

of FDI inflows than others. These results provide robust evidence affirming the role of institutions in enhancing the effectiveness of FDI in promoting EG in ASEAN countries.

This can be explained as follows: a more developed institutional setting motivates and facilitates both foreign and local firms to compete for output rationalization and curtails the negative impacts of FDI on growth (Wang et al., 2013). However, poor institutions can add extra costs to FDI, such as in cases of corruption (Wei, 2000; Ho & My-Linh, 2023). Likewise, due to high sunk costs, FDI is especially vulnerable to uncertainty, including uncertainty stemming from poor government efficiency, policy reversals, graft, or weak enforcement of property rights and the legal system in general.

Reality has also proven that, during the initial stages of liberalization, ASEAN countries with poor institutional quality, loose legal regulations, and a high level of corruption created conditions for foreign enterprises to invest in outdated technology and low-productivity sectors, leading to FDI inflows trending towards energy and resource-intensive industries, resulting in transfer pricing, environmental degradation, and adverse economic growth effects.

Moreover, underdeveloped infrastructure also contributes to diminishing the positive impact of FDI. Low institutional quality is often associated with underdeveloped infrastructure. This can reduce the ability of countries to leverage FDI for economic development projects. For example, transportation or energy infrastructure deficiencies can increase business costs and reduce a country's competitiveness. Finally, limited technology absorption capacity is a crucial factor. Countries with low institutional quality may struggle to absorb and implement new technology. This can reduce the benefits of FDI, as foreign companies may not be able to transfer technology or management processes effectively to these countries.

In our sample, only Laos is the country with an institutional quality level below the threshold. It is understandable because Laos is facing significant institutional challenges that hinder the positive impact of foreign direct investment (FDI) on its economic growth. The country's weak governance structure, characterized by inefficiencies in public administration and a lack of transparency, complicates the business environment, leading to delays and increased costs for domestic and foreign investors. Corruption is pervasive across various sectors, diverting funds from productive uses and deterring potential investments. Additionally, the underdeveloped legal framework of Laos creates uncertainty and increases the risks associated with investing in the country. While Laos enjoys relative political stability, the centralized decision-making process within its one-party system can stifle innovation and reduce government responsiveness to economic challenges. Moreover, the country's infrastructure is still in its early stages of development, with significant gaps in transportation, energy, and communication networks. These institutional weaknesses contribute to the reality that FDI in Laos often does not lead to positive economic outcomes and can sometimes stunt growth. Without substantial improvements in governance, legal frameworks, and infrastructure, the potential benefits of FDI in Laos will likely remain limited.

Conversely, when governments improve institutional quality through political stability, appropriate investment legal frameworks, strict environmental regulations, and enhanced management efficiency accompanied by rigorous anti-corruption measures, it fosters trust among investors. Moreover, good institutional quality also allows countries to select environmentally friendly "green" FDI inflows and align them with suitable industry sectors, thereby promoting the spillover effects of FDI on economic growth. Additionally, through FDI activities, the process of transferring advanced production technology, professional management skills, and upgrading the professional competence of the labor force from the investing country to the host country contributes to enhancing the production capacity of domestic enterprises and the skill level of the labor force (Gorg & Greenaway, 2003). Furthermore, ASEAN countries can use FDI to improve infrastructure, such as developing transportation, energy, and information technology infrastructure. Improving infrastructure not only enhances competitiveness but also promotes sustainable economic growth.

5. Conclusion and Recommendations

This research aims to evaluate the impact of FDI on EG and explore the role of institutions in enhancing the effectiveness of FDI inflows on EG in ASEAN countries, including Vietnam. This study is accomplished by using the Feasible Generalized Least Squares (FGLS) estimation method and the threshold test by Hansen (1999), adjusted by Wang (2015), using panel data for nine ASEAN countries for the period from 2002 to 2020.

The results reveal significant and positive evidence of FDI's impact on EG and underscore the critical role of institutional quality in improving the effectiveness of FDI on growth in ASEAN countries. The regression results suggest that institutions act as a supportive factor, indirectly promoting EG in these countries through FDI activities. Additionally, this research identifies an institutional threshold value, signifying that the direction of FDI impact on growth switches from negative to positive as institutional quality transitions from below the threshold to above it. It underscores the significance of enhancing institutional quality in increasing FDI attractiveness while promoting the positive spillover effects of FDI on ASEAN countries' EG. The results also highlight the positive impact of trade openness, labor, and inflation on EG, aligning with the endogenous growth theory, which emphasizes the positive role of the labor force in EG. On the other hand, government expenditure shows an adverse effect on EG.

FDI has affirmed its role and importance in EG. However, recent events such as the COVID-19 pandemic and the Russia–Ukraine conflict have heightened awareness of the benefits and risks associated with these capital inflows. Countries, especially developing nations, must now prioritize maximizing the benefits of FDI, enhancing domestic production capacity and ensuring sustainable growth rather than just maximizing FDI inflows.

Based on the research findings, we propose several recommendations to improve institutional quality and enhance the positive impact of FDI on the economy. Firstly, to maintain and boost FDI inflows, ASEAN governments should ensure political stability and improve the existing legal investment framework to protect investors' rights and create a level playing field for competition. Additionally, these countries must enhance public service quality, propose more robust measures for controlling corruption, and improve the business environment to attract FDI and stimulate EG. To enhance the effectiveness of corruption control, governments should establish a transparent and accountable working environment and conduct regular assessments of corruption risks within relevant state agencies and organizations related to business activities.

Despite research findings on the influence of institutional quality on the effectiveness of FDI impact on growth, yielding practical and theoretical significance, certain limitations persist. Specifically, some nations unique to FDI activities within the ASEAN countries, such as Brunei and Singapore, characterized by a distinctive trend of FDI outflows more than inflows, have yet to be individually isolated for study. Therefore, in subsequent studies, we will separate these countries for dedicated examination to assess the differences between these nations and others within the ASEAN bloc regarding the impact of FDI on EG under varying institutional quality conditions.

In light of the above findings, future research could delve into crucial areas concerning FDI, institutional quality, and economic growth. First, we intend to conduct an FDI meta-study in the near future to gain a comprehensive understanding of its role and impact on economic growth. This endeavor would effectively illuminate the various aspects of FDI's influence. Henceforth, it provides policymakers with a robust foundation to construct policy frameworks that align with each country's specific developmental stages and relevant sectors. Next, one promising direction is to investigate the threshold effects of institutional quality more granularly across different sectors and stages of economic development within ASEAN countries. Understanding how varying levels of institutional quality influence the effectiveness of FDI in specific sectors could provide valuable insights for policy-making. Additionally, future studies could examine the interplay between institutional quality and infrastructure development in determining the success of FDI. Analyzing how improvements in infrastructure, driven by FDI, interact with institutional quality to impact economic growth could reveal strategies for maximizing FDI benefits. Furthermore, the research could explore the role of technology transfer and management skill enhancement facilitated by FDI in different institutional contexts, assessing their contributions to sustainable development. By addressing these areas, researchers can offer more detailed recommendations for leveraging FDI to foster economic growth and development in countries with diverse institutional landscapes.

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