Available online at www.ijournalse.org

Emerging Science Journal

(ISSN: 2610-9182)

Vol. 7, No. 6, December, 2023

Impacts of Foreign Direct Investment on Economic Development: Does Institutional Quality Matter?

Thuy T. Dang [1], Tran Thi Kim Oanh [2*], Ha Luong Thanh [3], Trung Ngoc Nguyen [4]

[1] *Institute for Indian and Southwest Asian Studies, Vietnam Academy of Social Sciences (VASS), Hanoi, Vietnam.*

[2] *University of Finance-Marketing, Ho Chi Minh City, Vietnam.*

[3] *Banking Academy, Hanoi, Vietnam.*

[4] *Head of Party Economic, Department and Assistant to the Politburo Member, Secretary of Ho Chi Minh City Party Committee, Vietnam.*

Abstract

The linkage between foreign direct investment (FDI) and economic development has been demonstrated in economic literature. In this study, we analyze the impact of FDI on economic development, considering the role of institutional quality in 63 provinces/cities in Vietnam in the period 2005–2022. Applying various regression methods, such as Pooled OLS, FEM, REM, GMM, and PVAR, the results confirm that foreign direct investment and institutional quality have a positive impact on economic development. Findings also provide evidence that institutional quality is an important factor in attracting FDI, determining both the quality and quantity of inflows from other countries into Vietnam. Some policy implications are given to promote the role of institutions and attract foreign direct investment, thereby promoting the economic development of provinces and cities in Vietnam.

Keywords:

Economic Development;
Foreign Direct Investment;
GMM; PVAR; Institutional Quality.

Article History:

Received:	20	June	2023
Revised:	05	September	2023
Accepted:	17	October	2023
Published:	01	December	2023

1- Introduction

In the process of globalizing the world economy, foreign direct investment (FDI) plays an important role in the economic growth and development of the national economy [1]. Because they anticipate long-term economic growth from more stable resources in host countries, most nations, particularly emerging nations, try to entice FDI into their economies. The host country's benefits from high technology, skills, research and development (R&D), and know-how are just a few of the core factors that make FDI appealing [2]. The influence of FDI on economic development has been examined in many studies, but the results are still controversial. Some papers argue that FDI has a positive effect on the economic growth of the host country [3, 4]; however, some studies provide the opposite results [5, 6]. In addition, the third research group suggested that the impact of FDI on the local economy depends on the country's absorptive capacity, human capacity, and level of economic and financial development [7].

Realizing the important role of FDI inflows, Vietnam has quickly opened up its economy, traded with foreign countries, and received FDI as an important source of capital for economic development since the reform policy known as Doi Moi in 1986. According to the FDI Regulatory Restrictiveness Index of the OECD, Vietnam is one of the economies with the largest openness to FDI in the ASEAN region. In 2021, despite being affected by the COVID-19

* **CONTACT**: kimoanh@ufm.edu.vn

DOI: http://dx.doi.org/10.28991/ESJ-2023-07-06-05

epidemic, the FDI attraction of Vietnam is estimated at 31.15 billion USD, up 9.2% over the same period in 2020 (GSO). Besides the assessment that FDI is a bright spot in Vietnam's economic picture, there are worries about the absorption of this capital flow. Experts have warned of risks when Vietnam's economy is too dependent on external resources. The contribution of the FDI sector to Vietnam's GDP growth is increasing, from 14.6% in the period 1991–1995 to over 20% after 2010.

Despite attracting large FDI inflows, Asian countries - including Vietnam - are facing a situation of low institutional quality (IQ) [8]. Litjobo (2009) [9] argued that high IQ is always a factor highly appreciated by international organizations, as well as a prerequisite for promoting the development of the national economy. Conversely, low IQ will impede foreign investment growth, posing challenges in achieving economic development goals. Jude & Levieuge (2017) [10] suggested that the mixed effects of FDI on economic growth in previous studies come from the institutional differences between countries. The authors argued that IQ regulates the magnitude of the impact of FDI on economic growth. What impact do the quality of institutions and FDI inflows have on Vietnam's economic development? Does FDI infusion significantly contribute to economic development by gradually raising IQ? Does the amount of FDI coming in affect how well institutions perform in terms of economic development? The intimate connection between FDI inflows, IQ, and economic growth has not been studied in the existing literature in terms of both theoretical and empirical studies, particularly the simultaneous influence of FDI inflows and IQ on economic development. In this paper, we examine the impact of FDI and IQ on the economic development of 63 provinces and cities in Vietnam over the period 2005–2022. This paper has three important contributions, as follows: First, we analyze the impact of FDI on economic development. Second, we consider the simultaneous impact of FDI and IQ on economic development. Third, we explore the role of IQ in moderating the impact of FDI on economic development.

The rest of the article is structured as follows: The next section provides an overview of the literature on the relationship between FDI, IQ, and economic development. The dataset and methodology are presented in Section 3. Section 4 shows the research results, and they are discussed in Section 5. Finally, some conclusions and policy recommendations are mentioned in Section 6.

2- Literature Review

2-1- The Impact of FDI Inflows on Economic Development

There have been many theories studying the relationship between economic growth and FDI. One of them is the exogenous growth theory, also known as the neoclassical growth theory or the Solow-Swan growth model, pioneered by Solow (1956) [11]. Assuming that the amount of labor and the degree of technology remain constant over the short term, this theory states that an increase in the cumulative volume of investment should increase growth [12, 13]. The amount of capital accumulation and the expansion of the workforce as a result of technological advancements are the two factors that determine economic growth. As a result, FDI will produce a more consistent return on investment if it increases labor and capital productivity. Exogenous growth follows as a result [13].

Exogenous growth theory was replaced by endogenous growth theory in the middle of the 1980s because it was no longer conceptually sufficient to describe the factors that affect long-term growth. Diminishing returns on capital is the basic tenet of this theory [14]. Technological developments in the form of fresh concepts are to blame for this decline. R&D, the building of human capital, and spillover are therefore evaluated as factors that influence long-term economic growth. When information developed through R&D in one country has a positive impact on other countries, this phenomenon is known as the spillover effect [15]. Several empirical studies about the impact of FDI on economic development were conducted. Hijzen & Swaim (2008) [16] found that FDI contributes mainly to the economic development of the host country. Similarly, Ozturk (2007) [17] examined studies on FDI and economic growth. This article suggests that FDI has a positive effect on economic growth.

Another study by Moran (2011) [18] argued that, in developed and developing countries, the influence of FDI on economic growth and development is different depending on the political structure and economic conditions of that country. According to Olofsdotter (1998) [19] and Acemoglu et al. (2003) [20], in countries with weak organizational conditions, the effect of FDI on economic growth and development is also low.

Having the same goal of exploring the impact of FDI on economic growth and development, Tintin (2012) [21] collected data from 125 countries for the period 1980–2010. The results also showed that FDI and economic development have a positive relationship. Findings also implied that the impact of FDI on developing countries is higher than the other two groups.

By applying the ARDL model, Ahmad et al. (2022) [22] concluded that FDI stimulates the economic growth of Pakistan. Also studying the impact of FDI on economic growth, Yimer (2023) [23] suggested mixed results. Using a dynamically common correlation effect approach for an error-correction model for the Africa dataset from 1990 to 2016, the results indicate that FDI has a significantly positive effect in the long run-on investment- and factor-driven economies, while this effect in fragile economies is insignificant in both the short and long term.

In Vietnam, research on the relationship between FDI, economic development, and IQ is still quite limited. On the other hand, the existing literature often revolves around only two factors, FDI and economic growth, there are still few analytical studies on FDI and economic development. Research by Nguyen & Tran (2011) [24] explored the role of FDI in economic development. By analyzing the indicators of increasing social investment capital, increasing industrial production output and export turnover, economic restructuring, increasing employment and national budget revenue along with other contributions to economic growth. Data was collected from the General Statistics Office, Ministry of Planning and Investment for the period from 1988 to 2008.

With the research objective of analyzing and determining the correlation between FDI and key economic indicators, Dat et al. (2020) [25] found that FDI affects the entire economy, especially a great impact on the value of economic development indicators.

2-2- The Relationship between FDI and Economic Development Considering the Role of Institutional Quality

Using System Generalized Method of Moments (SGMM) estimators, Nguyen et al. (2018) [26] examined the effect of IQ on the economic growth of 29 emerging economies between 2002 and 2015. The study indicated that IQ has a considerable positive impact on economic growth. Additionally, the negative effects of foreign direct investment (FDI) on economic growth are hampered by IQ. However, if FDI seeks to maximize its spillover effects, boosting IQ might lessen the rivalry brought about by trade openness. To evaluate the direct effects of IQ on economic growth and the indirect effects of IQ on economic development through increasing FDI-induced economic growth, Hayat (2019) [27] employed a dataset of 104 nations and applied the GMM estimation method to the dynamic panel data. Results indicated that higher IQ and FDI inflows both support stronger economic growth. Improved IQ, in particular in low- and middle-income nations, also supports FDI-driven economic growth. In contrast, it was discovered that FDI was the root of the slow economic growth in high-income countries. Adegboye et al. (2020) [28] studied the impact of institutional challenges on FDI flows and its impact on economic development for 30 countries in sub-Saharan Africa (SSA) from 2000 to 2018. The results revealed that the quality of institutions is the determining factor that also affects the extent to which FDI inflows to the host SSA sub-region, leading to underutilization of domestic resources and hence abnormal development of domestic sector investment.

Miao et al. (2020) [29] examined the effects of China-Africa trade and China's FDI on the growth of African countries controlling the mediating role of IQ. Applying the two-step system Generalized method of moments (GMM) for robust data over the period of 2003–2017, the findings demonstrated that effective policy action to enhance country IQ and coordination between China-Africa trade and Chinese FDI to African countries is still necessary for the positive effects of China-Africa trade and Chinese FDI on economic growth for African countries.

The regulatory role of IQ in the FDI-economic growth relationship is also considered in the study of Dada & Abanikanda (2022) [30]. Applying the ARDL method to Nigeria's data for the period 1984-2018, the study confirmed that good IQ plays an important role in foreign direct investment and growth in Nigeria. Ullah et al. (2022) [31] applied GMM to study the impact of FDI and IQ on economic growth, especially considering the role of IQ in the FDI - economic growth relationship in 80 countries. The study provided evidence of the positive effects of FDI and IQ on economic growth. In particular, IQ increases the degree of influence of FDI on economic growth in all three studied regions including Asia, Latin America and the Caribbean, and Sub-Saharan Africa (SSA). In general, generally, most studies confirmed that institutions act as important absorptive capacities that need to be strengthened in order for the country to benefit maximally from the growth impact of foreign direct investment. However, these studies have mainly focused on developing or developing countries, on regions, or on groups of countries. The absorption of FDI in different countries, even in provinces/cities within a country also has differences. Therefore, this study focuses on 63 provinces and cities in Vietnam. In addition, studying the relationship between FDI inflows and economic development, considering the role of IQ of each province, along with the use of different research methods will help to increase the robustness of the results and overcome the limitations of previous studies.

3- Dataset and Methodology

3-1- Dataset

In this study, we use annual balanced panel data of 63 provinces/cities in Vietnam for the period 2005 - 2022. Data are collected from the Statistical Yearbook, an annual publication by the General Statistics Office of Vietnam, during the study period.

3-2- Methodology

This paper studies the linkage between FDI inflows, IQ, and economic development in 63 provinces and cities in Vietnam. The article applies the following research models:

$$DRDP_{it} = \beta_0 + \beta_1 FDI_{it} + \beta_2 EDU_{it} + \beta_3 UNE_{it} + \beta_4 URB_{it} + \beta_5 PI_{it} + \beta_6 PE_{it} + \beta_7 TC_{it} + \beta_8 PINV_{it} + \beta_9 POP_{it} + e_{it} \quad \text{(Model 1a)} \quad (1)$$

$$DRDP_{it} = \beta_0 + \beta_1 FDI_{it} + \beta_2 EDU_{it} + \beta_3 UNE_{it} + \beta_4 URB_{it} + \beta_5 IQ_{it} + \beta_6 PI_{it} + \beta_7 PE_{it} + \beta_8 TC_{it} + \beta_9 PINV_{it} + \beta_{10} POP_{it} + e_{it} \quad \text{(Model 1b)} \quad (2)$$

$$DRDP_{it} = \beta_0 + \beta_1 FDI_{it} + \beta_2 EDU_{it} + \beta_3 UNE_{it} + \beta_4 URB_{it} + \beta_5 IQ_{it} + \beta_6 PI_{it} + \beta_7 PE_{it} + \beta_8 TC_{it} + \beta_9 PINV_{it} + \beta_{10} POP_{it} + \beta_{11} FDI * IQ_{it} + e_{it} \quad \text{(Model 1c)} \quad (3)$$

where $DRDP$ is Economic development by province, FDI_{it} is FDI inflows by province, EDU_{it} is Education rate by province, UNE_{it} is Unemployment rate by province, URB_{it} is Urbanization rate by province, IQ_{it} is Institutional quality by province, PI_{it} is Public investment by province, PE_{it} is Public expenditure by province, TC_{it} isTechnological capacity by province, $PINV_{it}$ is Private investment by province, POP_{it} is Population by province, $FDI * IQ_{it}$ is Interaction variable between FDI and institutional quality by province, β_0 is the intercept, $\beta_1, \beta_2, \dots, \beta_{11}$ are the estimation coefficient and e_{it} is Error term.

Several methods such as the Pooled-OLS regression model, fixed effects model (FEM), and random effects model (REM) are applied in this article. After that, we continue to apply FGLS and GMM methods to handle the heteroscedasticity and endogeneity in the research model.

In addition, the study also applies the Panel Vector Autoregressive model (PVAR) to assess the impact of FDI inflows and IQ on economic development in Vietnam. The results of the PVAR model are also used to compare with the results of the above regression models (Pooles-OLS, FEM, REM, and FGLS). The PVAR model is as follows:

$$Y_{i,t} = A_1 Y_{i,t-1} + A_2 Y_{i,t-2} + \cdots + A_k Y_{i,t-k} + u_i + \varepsilon_{i,t} \quad \text{(Model 1d)} \quad (4)$$

where $Y_{i,t}$is$(DRDP_{i,t}; FDI_{i,t}; PINV_{i,t}; TC_{i,t}; PE_{i,t}; PI_{i,t}; IQ_{i,t}; UNE_{i,t}; URB_{i,t}; EDU_{i,t}; POP_{i,t})$ is a 1×11 vector of the endogenous variable, $Y_{i,t-p}$ is a 1×11 vector of lagged endogenous variables, $A_1, A_2, \dots, A_k$ is a (kxk) vector of the estimated coefficients, k is the optimal lag, u_i is a fixed-effect vector for the dependent variable, and $\varepsilon_{i,t}$ is the error terms.

Table 1 presents the measurement of variables.

Table 1. Description of variables in the research model

Sign	Variables	Expected sign (+/-)	Measurement	Studies
		Dependent variable		
DRDP	Economic development in each province		Provincial GRDP/province average population	[32]
		Independent variables		
FDI	Sources of foreign direct investment	+	Capital inflows by province)/GRDP	[32, 33]
EDU	Education	-	High school graduation rate by province (%)	[32]
UNE	Unemployment rate	-	The province's total number of unemployed workers to the province's total labor force (in %)	[32]
URB	urbanization rate	+	Urban population / total population of the province (%)	[32]
IQ	Institutions	+	Provincial Competitiveness Index (PCI) (%)	[32]
PI	Government's Invest	+	Provincial public investment / GRDP of each province (%)	[34]
PE	Public spending	-	Provincial Public Expenditure / Provincial GRDP (%)	[35]
TC	Technology capacity	+	Provincial balance of payments for modern machinery and equipment	[36]
PINV	Domestic private investment	+	Domestic private investment capital in the province / Provincial GRDP (%)	[33]
POP	Population	-	Natural logarithm of population by province	[37]

4- Results

4-1- Descriptive Statistics and Preliminary Tests

Table 2 shows that the model has 11 variables and 1,134 observations. All variables have a positive average value. FDI ranges from -0.7111921 to 0.9494428 and has an average value of 0.7372443. The negative value of FDI represents fewer inflows of new investment than previous inflows. DRDP ranges from 1.828248 to 2.417244 and has an average value of 2.223965, showing a positive sign of economic development.

Table 2. Descriptive statistics of variables

No	Variables	Observations	Mean	Std. Dev.	Minimum	Maximum
1	DRDP	1,134	2.223965	0.0661809	1.828248	2.417244
2	FDI	1,134	0.7372443	0.1205199	-0.7111921	0.9494428
3	PINV	1,134	0.0352139	0.0249453	1.21e-07	0.1930419
4	TC	1,134	22.17233	2.661649	17.1346	31.55297
5	PE	1,134	0.3480988	0.236746	0	1.66915
6	PI	1,134	0.1810059	0.1795201	0.0008295	1.806794
7	IQ	1,134	0.5860823	0.0638302	0.3583	0.7761
8	UNE	1,134	0.0310173	0.127123	0.0014	3.65
9	URB	1,134	0.2645418	0.1663983	0.0004632	0.8725587
10	EDU	1,134	0.9223402	0.0917761	0.3857	0.9998
11	POP	1,134	13.9719	0.5774949	12.5721	16.44984

Table 3 displays the Variance Inflation Factor (VIF) results. It is understood that the variables' VIF values are all less than 10, proving that the model is not multicollinear.

Table 3. VIF test results

Model 1a			Model 1b			Model 1c		
Variable	**VIF**	**1/VIF**	**Variable**	**VIF**	**1/VIF**	**Variable**	**VIF**	**1/VIF**
PE	1.83	0.546147	TC	1.85	0.540082	FDIIQ	19.5	0.0512
TC	1.77	0.564168	PE	1.83	0.545858	FDI	14.66	0.06821
POP	1.75	0.57045	POP	1.76	0.567405	IQ	9.42	0.16157
URB	1.43	0.698621	URB	1.47	0.680413	TC	1.85	0.539841
PI	1.38	0.722027	PI	1.42	0.70647	PE	1.84	0.543795
FDI	1.16	0.86206	IQ	1.37	0.730933	POP	1.83	0.54695
PINV	1.16	0.862252	FDI	1.19	0.839322	URB	1.5	0.66886
EDU	1.09	0.91776	PINV	1.16	0.860643	PI	1.42	0.706332
UNE	1.02	0.978142	EDU	1.14	0.875662	EDU	1.17	0.855635
-	-	-	UNE	1.02	0.977648	PINV	1.16	0.860492
-	-	-	-	-	-	UNE	1.02	0.976866
Mean VIF	***1.4***		***Mean VIF***	***1.42***		***Mean VIF***	***5.03***	

4-2- Regression Analysis

4-2-1- Results by GMM Method

Table 4 displays the Model 1a regression outcomes. The outcomes of the Pooled OLS, FEM, and REM estimation are shown in columns 1, 2, and 3 of this table. The Chow test and Hausman test findings indicate that FEM is the most appropriate model for the data. However, Table 4 demonstrates the presence of heteroscedasticity and autocorrelation at the 1% level of significance (Prob > chi2 = 0.0000). Because of this, the author decided to use the FGLS estimate in the study to avoid heteroscedasticity and autocorrelation [38]. The FGLS approach can be used with variables that have undergone a model transformation from one that does not adhere to the traditional assumptions to one that does. The FGLS estimation results are shown in Column 4 of Table 4 as more trustworthy estimated parameters from the new model. Finally, we apply the GMM method to address potential endogeneity. Some variables in the model have endogenous phenomena such as FDI and DRDP, PI and DRDP. Therefore, the study only uses the results of the GMM method, presented in Column 5 of Table 4, to analyze and interpret the results.

Table 4. GMM regression results

VARIABLE	Model 1a					Model 1b					Model 1c				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	DRDP	DRDP	DRDP	DRDP	DRDP	DRDP	DRDP	DRDP	DRDP	DRDP	DRDP	DRDP	DRDP	DRDP	DRDP
	POOLED	FEM	REM	FGLS	GMM	POOLED	FEM	REM	FGLS	GMM	POOLED	FEM	REM	FGLS	GMM
FDI	-0.0415***	-0.0569***	-0.0609***	-0.0108*	0.0141***	-0.0182	-0.0306***	-0.0322***	-0.00691	0.0175***	-0.259**	-0.417***	-0.352***	-0.00867	0.0322
	[-3.49]	[-5.14]	[-5.11]	[-1.93]	[6.69]	[-1.63]	[-3.12]	[-3.03]	[-1.27]	[7.12]	[-2.10]	[-3.55]	[-2.84]	[-0.10]	[0.64]
PINV	0.0174	0.262***	0.044	0.014	-0.0391***	0.047	0.289***	0.118*	0.0196	-0.0126	0.0456	0.286***	0.112	0.145**	-0.0118
	[0.30]	[3.09]	[0.57]	[0.29]	[-2.65]	[0.88]	[3.90]	[1.69]	[0.44]	[-1.23]	[0.86]	[3.88]	[1.62]	[2.29]	[-0.76]
TC	0.00388***	0.0270***	0.00551***	0.00432***	0.000429***	0.00220***	0.0188***	0.00274**	0.00367***	0.000398***	0.00223***	0.0199***	0.00306***	0.0235***	0.000212
	[5.83]	[11.21]	[4.61]	[5.79]	[5.01]	[3.50]	[8.72]	[2.33]	[5.47]	[4.45]	[3.54]	[9.16]	[2.59]	[10.29]	[0.66]
PE	-0.0017	0.00493	0.0142	-0.00376	0.00104	-0.00379	-0.0162*	-0.00282	-0.00326	-0.00638***	-0.00464	-0.0169**	-0.0036	-0.00888	-0.0126***
	[-0.22]	[0.51]	[1.52]	[-0.57]	[0.38]	[-0.54]	[-1.89]	[-0.33]	[-0.52]	[-3.03]	[-0.66]	[-1.98]	[-0.42]	[-1.26]	[-4.13]
PI	-0.110***	-0.103***	-0.119***	-0.0903***	-0.0174***	-0.0942***	-0.0854***	-0.0975***	-0.0812***	-0.00456	-0.0940***	-0.0870***	-0.0985***	-0.0886***	-0.00473
	[-12.58]	[-12.55]	[-13.63]	[-12.96]	[-4.24]	[-11.55]	[-11.76]	[-12.47]	[-11.97]	[-1.06]	[-11.53]	[-12.03]	[-12.62]	[-13.63]	[-1.36]
IQ	-	-	-	-	-	0.291***	0.351***	0.367***	0.171***	0.0654***	0.00253	-0.11	-0.0148	0.220**	0.0294
	-	-	-	-	-	[12.88]	[17.18]	[16.88]	[11.38]	[12.51]	[0.02]	[-0.78]	[-0.10]	[2.21]	[0.55]
UNE	-0.00505	-0.00846	-0.00508	0.000351	0.00441***	-0.00789	-0.00946	-0.00708	0.000186	0.00438**	-0.00734	-0.00893	-0.00655	-0.00305	-0.0014
	[-0.48]	[-0.97]	[-0.53]	[0.10]	[3.11]	[-0.81]	[-1.25]	[-0.84]	[0.05]	[2.34]	[-0.75]	[-1.18]	[-0.78]	[-0.82]	[-1.09]
URB	0.113***	0.397***	0.167***	0.126***	0.00716***	0.0948***	0.388***	0.165***	0.116***	0.0106***	0.0925***	0.383***	0.161***	0.382***	-0.0003
	[11.88]	[13.68]	[9.86]	[10.98]	[6.57]	[10.57]	[15.34]	[10.13]	[10.27]	[7.49]	[10.24]	[15.15]	[9.86]	[14.61]	[-0.05]
EDU	0.244***	0.165***	0.229***	0.0723***	0.00568***	0.204***	0.134***	0.182***	0.0779***	-0.00675***	0.209***	0.138***	0.187***	0.0824***	0.00992
	[16.14]	[12.01]	[15.88]	[9.21]	[3.12]	[14.26]	[11.0]	[14.11]	[10.39]	[-3.21]	[14.42]	[11.37]	[14,37]	[10.06]	[1.61]
POP	-0.0908***	-0.0536***	-0.0840***	-0.0880***	-0.0146***	-0.0934***	-0.0746***	-0.0903***	-0.0929***	-0.0201***	-0.0924***	-0.0756***	-0.0893***	-0.0612***	-0.0114***
	[-29.79]	[-5.25]	[-16.01]	[-25.04]	[-23.92]	[-33.01]	[-8.29]	[-17.79]	[-27.70]	[-21.72]	[-32.09]	[-8.44]	[-17.57]	[-6.69]	[-4.68]
FDIIQ	-	-	-	-	-	-	-	-	-	-	0.387**	0.607***	0.506***	-0.00824	-0.0491
	-	-	-	-	-	-	-	-	-	-	[1.96]	[3.31]	[2.59]	[-0.06]	[-0.62]
L.DRDP	-	-	-	-	0.870***	-	-	-	-	0.793***	-	-	-	-	0.914***
	-	-	-	-	[119.68]	-	-	-	-	[88.17]	-	-	-	-	[34.16]
_cons	3.202***	2.166***	3,080***	3.278***	0.480***	3.127***	2,451***	3,037***	3.254***	0.699***	3.287***	2.732***	3,255***	2.128***	0.331***
	[75.91]	[14.98]	[43.46]	[68.48]	[18.80]	[79.16]	[19.27]	[44.48]	[71.44]	[24.62]	[36.22]	[17.93]	[30.00]	[13.47]	[3.53]
N	1134	1134	1134	1134	756	1134	1134	1134	1134	1071	1134	1134	1134	1134	1071
Coefficient of determination	0.594***	0.0648***	0.7061***	-	-	0.6516 ***	0.1379***	0.6682***	-	-	0.6525***	0.143***	0.6685***	-	-
Chow test	-	10.32***	-	-	-	-	13.56***	-	-	-	-	13.77***	-	-	-
Hausman test	-	249.41***	-	-	-	-	204.48***	-	-	-	-	482.46***	-	-	-
Heteroskedasticity test	-	3393.5***	-	-	-	-	531.16***	-	-	-	-	481.00***	-	-	-
Autocorrelation test	-	127,093***	-	-	-	-	129,693***	-	-	-	-	129,887***	-	-	-
Sargan test	-	-	-	-	0.024	-	-	-	-	0.044	-	-	-	-	0.017
AR(2) test	-	-	-	-	0.920	-	-	-	-	0.633	-	-	-	-	0.782

Notes: *, **, and *** indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Similarly, Columns 6, 7, 8, 9, and 10 of Table 4 present the Pooled OLS, FEM, REM, FGLS, and GMM regression results of Model 1b; Columns 11, 12, 13, 14 and 15 show the Pooled OLS, FEM, REM, FGLS and GMM regression results of Model 1c. In model 1a, which did not include the IQ variable, FDI has a significant effect on promoting local economic growth in Vietnam with a significance level of 1%. When including the variable of IQ in model 1b, both FDI and IQ have a positive impact on economic growth. The interaction between the variable FDI and IQ (FDIIQ) in model 1c also has a positive impact on economic growth in provinces/cities of Vietnam. However, this effect is not statistically significant.

4-2-2- Results by PVAR Method

The data series must be stationary for the PVAR model to work. The Augmented Dicker Fuller (ADF) test is used to determine whether each variable has a unit root. Table 5 displays the outcomes of the unit root test. The ADF test findings show that all of the variables are stationary at values at a 1% level of significance. As a result, we can run the PVAR model.

Table 5. Augmented Dickey-Fuller test

Variables	t -statistic
DRDP	448.0433***
FDI	530.9023***
PINV	186.1553***
TC	201.9892***
PI	254.7332***
PE	212.9772***
IQ	244.1157***
UNE	238.7834***
URB	553.8518***
EDU	303.0372***
POP	383.5426***

The stability of the PVAR model needs to be verified in the following step. The Inverse Roots of the AR Characteristic Polynomial are shown in Figure 1. No roots are visible outside of the unit circle, demonstrating that the PVAR model satisfies the stability requirement (Table 6).

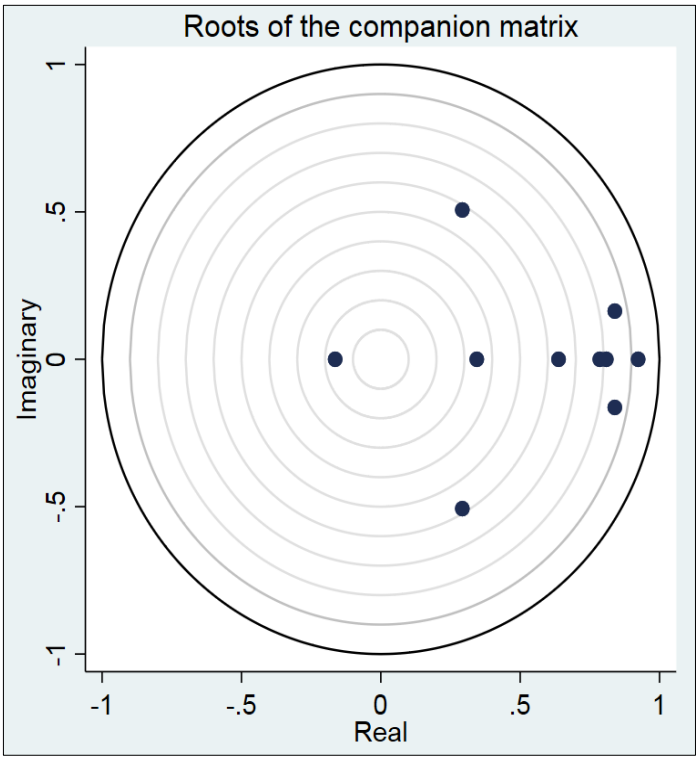

Figure 1. Stability in the impact model of foreign direct investment on economic development

Table 6. Estimation results by PVAR method

Variables	DRDP	Variables	DRDP
DRDP	0.887*** [73.94]	IQ	-0.001764 [-0.22]
FDI	0.00734* [1.80]	UNE	-0.00197* [-1.67]
PINV	0.225*** [6.14]	dURB	0.015988 [1.38]
TC	0.0019** [2.15]	EDU	-0.008548 [-1.80]
PE	0.001347 [0.55]	POP	-0.003081 [-0.47]
PI	-0.001591 [-0.67]	-	-

Notes: *, **, and *** indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Figure 2 describes the responses of DRDP after shocks of other variables as well as the responses of other variables after a DRDP shock (see Table 7).

- An FDI shock will cause DRDP to rise for the next year and then decline. Specifically, when FDI increases by 1%, it will increase DRDP by 0.0122%, but then in a short time it causes DRDP to return to zero and to negative (unsatisfactory results). On the other hand, in the long term, this shock will continue to affect DRDP and make DRDP tend to stabilize again.
- A PINV shock causes DRDP to increase by 0.00046%. However, this positive trend only lasts for one year, after that DRDP gradually decreases and steadily stays at negative value.
- A technology capacity shock will boost economic development in a very short time (less than a year). Specifically, an additional 1% TC will increase DRDP by 0.0124% and then slowly bring DRDP back to 0, finally, after experiencing many large and small fluctuations of the shock, DRDP stabilizes again and tends to increase slightly.
- Initially, an unemployment rate shock will not affect the DRDP, but when this shock causes large fluctuations, it will change the direction of the DRDP in an unstable way (slow increase in a short period of time and then gradually decrease).
- A DRDP shock has the effect of causing FDI, PINV, and TC to increase in the first year and maintain it for the next five years. Particularly, PINV tends to decrease from the sixth year onwards. As for the unemployment rate, a DRDP shock contributes to the reduction of this unemployment rate to a negative value and remains sustainable.

Table 7. Variance decomposition of DRDP

Period	DRDP	FDI	PINV	TC	UNE
1	1	0	0	0	0
2	0.9041613	0.0587515	0.001461	0.0314927	0.000253
3	0.8176431	0.0833119	0.035316	0.0860832	0.0006397
4	0.7519479	0.0887535	0.0049583	0.140425	0.0009858
5	0.7000852	0.087327	0.0058067	0.1894076	0.0012608
6	0.6567661	0.0835382	0.0062972	0.2333663	0.0014763
7	0.6182799	0.0789278	0.065836	0.2740498	0.0016513
8	0.5817515	0.0739379	0.0067537	0.313587	0.001802
9	0.5445365	0.0685595	0.0068532	0.3544154	0.0019416
10	0.5036108	0.062533	0.0069015	0.399654	0.0020818

The variance decomposition results of DRDP indicate that DRDP was 50.36% explained by itself, TC accounts for 39.96%, FDI accounts for about 6.3%, PINV accounts for 0.69% and 0.2 % of the shock explained by UNE. It can be seen, over 10 years, the contribution of FDI to economic development has tended to decrease, proving that the use of FDI capital in Vietnam has not been effective.

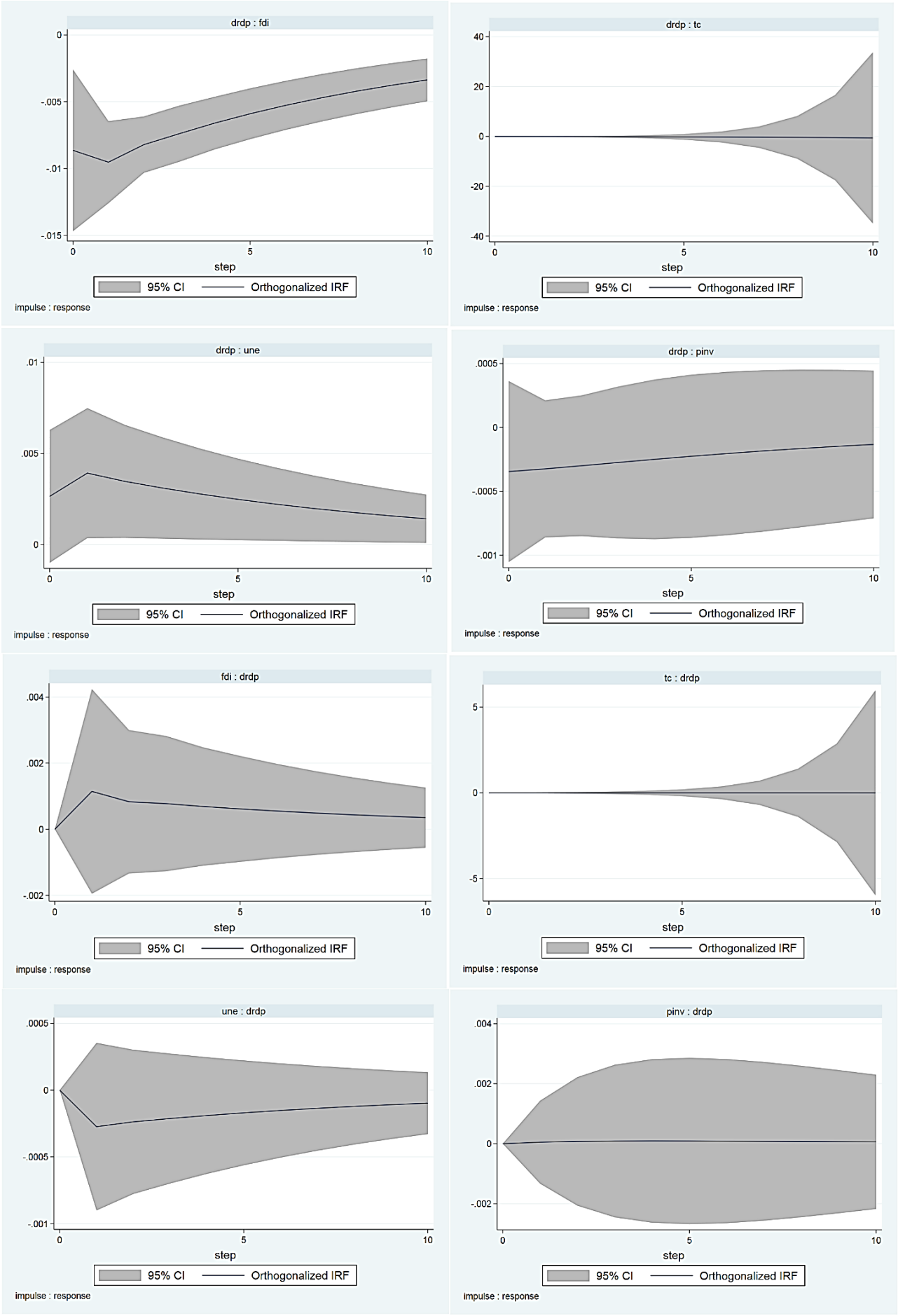

Figure 2. The impulse-response function results

4-2-3- Comparison of Research Results on the Impact FDI on Economic Development by GMM and PVAR Methods

A summary of research results on the impact of FDI on economic development is presented in Table 8.

Table 8. Summary of research results on the impact of FDI on economic development

Models without institutional quality variable						
	POOL	**FEM**	**REM**	**FGLS**	**GMM**	**PVAR**
FDI	X	X	X	X	X	X
PINV	N/A	X	N/A	N/A	X	X
TC	X	X	X	X	X	X
PE	N/A	N/A	N/A	N/A	N/A	N/A
PI	X	X	X	X	X	N/A
UNE	N/A	N/A	N/A	N/A	X	X
URB	X	X	X	X	X	N/A
EDU	X	X	X	X	X	X
POP	X	X	X	X	X	N/A
Models with institutional quality variable						
	POOL	**FEM**	**REM**	**FGLS**	**GMM**	**PVAR**
FDI	N/A	X	X	N/A	X	X
PINV	N/A	X	X	N/A	N/A	X
TC	X	X	X	X	X	X
PE	N/A	X	N/A	N/A	X	N/A
PI	X	X	X	X	N/A	N/A
IQ	X	X	X	X	X	N/A
UNE	N/A	N/A	N/A	N/A	X	X
URB	X	X	X	X	X	N/A
EDU	X	X	X	X	X	X
POP	X	X	X	X	X	N/A

Note: (X) are statistically significant variables; (N/A) are variables that are not statistically significant.

5- Discussion

This paper uses GMM and PVAR methods to investigate the impact of FDI inflows on economic development in Vietnam. The GMM results show that most of the variables are statistically significant and give almost similar results to previous studies on the impact of FDI on economic development. However, in the PVAR model, the variables are less statistically significant.

Foreign Direct Investment (FDI): The research results by GMM and PVAR methods show that FDI has a positive impact on economic development and is statistically significant at 1%. This result is consistent with previous studies [22, 23, 32]. FDI contributes to additional funds, technology, management capacity, business ability, organizational ability, and participation in the global supply chain in Vietnam, making it a particularly significant capital flow for growth and international economic integration. In addition to improving many commercial operations (expertise, technology, engineering, etc.), the rise of FDI significantly lowers the capital requirements for numerous large projects, hastening the period of Vietnam's international market expansion.

Local private investment (PINV): When there is local institutional intervention, PINV is not statistically significant in promoting economic development when estimated by GMM, while it has a positive effect on DRDP when estimated by the PVAR method. In the absence of institutional control, PINV negatively affects local economic development in the GMM method. This result is in contrast to the PVAR estimate when private investment has a positive effect on DRDP, which is consistent with Van Bon (2019) [33].

Technological Capability (TC): The gradual improvement of technological capacity in the provinces also shows that the level of local development is increasing and the gap between rich and poor is widening. The measurement results in both GMM and PVAR methods with two models with and without the influence of institutions, both show a positive impact of technological capacity on economic development. The estimated coefficient of TC has a positive value at a 1% of significant level, which is consistent with the study of Kim and Choi (2020) [36] on the influence of technological capacity on economic development.

Public expenditure (PE): When there is institutional intervention, PE has a negative impact on development (GMM). This result is consistent with Teixeira & Loureiro (2019) [35].

Public investment (PI): In the model with the IQ variable, the impact of PI on economic development is not statistically significant. In the model without the IQ variable, PI has a negative impact on economic development. This result is in contrast to the study of Mathur (2017) [32].

Institutional quality (IQ): Estimation results for the variable of institutional quality IQ by two methods GMM and PVAR give different results. While the results obtained from GMM show a positive impact of IQ on economic development, the results from PVAR method are not statistically significant. The results of the GMM method are inconsistent with Mathur (2017) [32].

Urbanization rate (URB): Regression results show that increasing urbanization rate will promote economic development (GMM). When rural areas are upgraded to urban areas, the income of the people there will change and be higher than in other rural areas in the province. The gap between the rich and the poor between the people living in the province is widening. This result is consistent with Mathur (2017) [32]. However, the PVAR estimation results show that URB is not statistically significant with economic development.

Unemployment rate (UNE): Findings suggest that the unemployment rate has a negative impact on economic development, similar to the study of Mathur (2017) [32]. This implies that a healthy economy requires the creation of more new jobs to meet the growing economy.

Education (EDU): The results from the GMM and PVAR methods for the model with the IQ variable show that EDU is negatively correlated with economic development. This means that the high school graduation rate is not enough to promote economic development. For the model without IQ variable, the GMM and PVAR methods give opposite results. Specifically, EDU positively affects DRDP in GMM method but negatively affects DRDP in PVAR method. The results are not in line with Mathur (2017) [32].

Population (POP): POP is not statistically significant when estimated by the PVAR method, but shows a negative impact on economic development when considered in both models with and without the IQ variable. This result is consistent with de Haan & Sturm (2017) [37].

6- Conclusion and Policy Implication

Using various regression methods such as Pooled OLS, FEM, REM, GMM, and PVAR, this paper investigates the impact of FDI inflows and institutional quality on economic development in 63 provinces/cities of Vietnam in the period 2005–2022. Research results provide evidence that institutional quality is an important factor in attracting investment capital from abroad, determining both the quality and quantity of inflows from major countries into Vietnam and boosting economic development. Therefore, Vietnam needs to simultaneously implement policies to promote the role of institutions in attracting FDI inflows and improving the role of FDI in the economy. In addition, provinces and cities need to take measures to promote private investment, strengthen technological capacity, and improve the quality of local institutions. Findings also suggest that technological capability, urbanization rate, and education affect economic development positively. These results imply that it is necessary to focus on investing in education, especially high-quality education, in order to create a highly skilled workforce to meet the development needs of the locality. In contrast, the unemployment rate and population negatively impact economic development. Hence, Vietnam needs appropriate policies to control population growth and reduce unemployment to promote economic development.

Besides the above results, the study still has some limitations. The article only focused on 63 provinces and cities in Vietnam. Therefore, to achieve more comprehensive research results, future researchers may incorporate more countries into their research.

7- Declarations

7-1- Author Contributions

Conceptualization, T.D.; methodology, T.D. and T.O.; software, T.O., H.L., and N.T.; validation, T.O., H.L., and T.D.; formal analysis, H.L. and N.T.; investigation, T.D.; resources, T.O.; data curation, T.D.; writing—original draft preparation, T.D. and N.T.; writing—review and editing, T.O. and T.D.; visualization, H.L. and N.T.; supervision, T.O.; project administration, T.O.; funding acquisition, T.D. All authors have read and agreed to the published version of the manuscript.

7-2- Data Availability Statement

The data presented in this study are available on request from the corresponding author.

7-3- Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

7-4- Acknowledgements

The authors acknowledge to be supported by the University of Finance - Marketing, Viet Nam.

7-5- Institutional Review Board Statement

Not applicable.

7-6- Informed Consent Statement

Not applicable

7-7- Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this manuscript. In addition, the ethical issues, including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, and redundancies have been completely observed by the authors.

8- References

[1] Domazet, I. S., & Marjanović, D. M. (2018). FDI as a Factor of Improving the Competitiveness of Developing Countries. Advances in Finance, Accounting, and Economics, 82–104, IGI Global, Pennsylvania, United States. doi:10.4018/978-1-5225-3026-8.ch005.

[2] Iamsiraroj, S. (2016). The foreign direct investment-economic growth nexus. International Review of Economics and Finance, 42, 116–133. doi:10.1016/j.iref.2015.10.044.

[3] Agosin, M. R., & Machado, R. (2005). Foreign investment in developing countries: Does it crowd in domestic investment? Oxford Development Studies, 33(2), 149–162. doi:10.1080/13600810500137749.

[4] Falki, N. (2009). Impact of foreign direct investment on economic growth in Pakistan. International Review of Business Research Papers, 5(5), 110-120.

[5] OECD. (2012). (2001). OECD Environmental Outlook. Organisation for Economic Cooperation and Development (OECD), Paris, France. doi:10.1787/9789264188563-en.

[6] Herman, M., Chisholm, D., & Leavell, H. (2004). FDI and the effects on society. Allied Academies International Conference. Academy for Studies in International Business. Proceedings: Jordan Whitney Enterprises, 4(1), 1-15.

[7] Alfaro, L., Chanda, A., Kalemli-Ozcan, S., & Sayek, S. (2004). FDI and economic growth: The role of local financial markets. Journal of International Economics, 64(1), 89–112. doi:10.1016/S0022-1996(03)00081-3.

[8] Huynh, C. M. (2021). Foreign direct investment and income inequality: Does institutional quality matter? Journal of International Trade & Economic Development, 30(8), 1231–1243. doi:10.1080/09638199.2021.1942164.

[9] Litjobo, R. (2009). FDI, governance and development: the case of Lesotho emerging from the periphery. Master Thesis, University of Witwatersrand, Johannesburg, South Africa.

[10] Jude, C., & Levieuge, G. (2017). Growth Effect of Foreign Direct Investment in Developing Economies: The Role of Institutional Quality. World Economy, 40(4), 715–742. doi:10.1111/twec.12402.

[11] Solow, R. M. (1956). A contribution to the theory of economic growth. Quarterly Journal of Economics, 70(1), 65–94. doi:10.2307/1884513.

[12] Barro, R. J., Sala-I-Martin, X., Blanchard, O. J., & Hall, R. E. (1991). Convergence across States and Regions. Brookings Papers on Economic Activity, 1991(1), 107. doi:10.2307/2534639.

[13] Songkajorn, Y., Aujirapongpan, S., Promma, W., Dowpiset, K., & Jutidharabongse, J. (2022). Attribute Implications and Reverberations of the Japanese Foreign Policy for Technology and Innovation Business in Thailand. Emerging Science Journal, 6(3), 544-552. doi:10.28991/ESJ-2022-06-03-09.

[14] Ho, S. C., Kauffman, R. J., & Liang, T. P. (2007). A growth theory perspective on B2C e-commerce growth in Europe: An exploratory study. Electronic Commerce Research and Applications, 6(3), 237–259. doi:10.1016/j.elerap.2006.06.003.

[15] De Mello, L. R. (1997). Foreign direct investment in developing countries and growth: A selective survey. Journal of Development Studies, 34(1), 1–34. doi:10.1080/00220389708422501.

[16] Hijzen, A., & Swaim, P. (2008). Do multinationals promote better pay and working conditions? The effect multinationals have on wages and working conditions can be positive, but there are conditions to bear in mind, not least for policymakers wishing to attract foreign direct investment. OECD observer, (269), 15-18.

[17] Ozturk, I. (2007). Foreign direct investment-growth nexus: a review of the recent literature. International Journal of Applied Econometrics and Quantitative Studies, 4(2), 79-98.

[18] Moran, T. (2011). Foreign direct investment and development: Launching a second generation of policy research: Avoiding the mistakes of the first, re-evaluating policies for developed and developing countries. Columbia University Press, New York City, United Staters.

[19] Olofsdotter, K. (1998). Foreign direct investment, country capabilities and economic growth. Weltwirtschaftliches Archive, 134(3), 534–547. doi:10.1007/bf02707929.

[20] Acemoglu, D., Johnson, S., Robinson, J., & Thaicharoen, Y. (2003). Institutional causes, macroeconomic symptoms: Volatility, crises and growth. Journal of Monetary Economics, 50(1), 49–123. doi:10.1016/S0304-3932(02)00208-8.

[21] Tintin, C. (2012). Does foreign direct investment spur economic growth and development: A comparative study? 14th Annual European Trade Study Group Conference, 13-15 September 2012, Leuven, Belgium.

[22] Ahmad, M. S., Szczepankiewicz, E. I., Yonghong, D., Ullah, F., Ullah, I., & Loopesco, W. E. (2022). Does Chinese Foreign Direct Investment (FDI) Stimulate Economic Growth in Pakistan? An Application of the Autoregressive Distributed Lag (ARDL Bounds) Testing Approach. Energies, 15(6). doi:10.3390/en15062050.

[23] Yimer, A. (2023). The effects of FDI on economic growth in Africa. Journal of International Trade & Economic Development, 32(1), 2–36. doi:10.1080/09638199.2022.2079709.

[24] Nguyen, C. T., & Tran, S. H. (2011). Economic Development under Reform and World Integration and the Main Factors Influencing the Economic Growth in Vietnam. Vnuhcm Journal of Science and Technology Development, 14(1), 5-27.

[25] Dat, P. M., Huan, N. V., & Hang, N. T. (2020). Applying the goal management model on the business governance in Vietnam in the context of international integration. World Scientific News, (149), 64-80.

[26] Nguyen, C. P., Su, T. D., & Nguyen, T. V. H. (2018). Institutional Quality and Economic Growth: The Case of Emerging Economies. Theoretical Economics Letters, 08(11), 1943–1956. doi:10.4236/tel.2018.811127.

[27] Hayat, A. (2019). Foreign direct investments, institutional quality, and economic growth. Journal of International Trade & Economic Development, 28(5), 561–579. doi:10.1080/09638199.2018.1564064.

[28] Adegboye, F. B., Osabohien, R., Olokoyo, F. O., Matthew, O., & Adediran, O. (2020). Institutional quality, foreign direct investment, and economic development in sub-Saharan Africa. Humanities and Social Sciences Communications, 7(1), 1–9. doi:10.1057/s41599-020-0529-x.

[29] Miao, M., Lang, Q., Borojo, D. G., Yushi, J., & Zhang, X. (2020). The impacts of Chinese FDI and China-Africa trade on economic growth of African countries: The role of institutional quality. Economies, 8(3), 53. doi:10.3390/ECONOMIES8030053.

[30] Dada, J. T., & Abanikanda, E. O. (2022). The moderating effect of institutions in foreign direct investment led growth hypothesis in Nigeria. Economic Change and Restructuring, 55(2), 903–929. doi:10.1007/s10644-021-09332-w.

[31] Ullah, S., Ali, K., & Ehsan, M. (2022). Foreign direct investment and economic growth nexus in the presence of domestic institutions: a regional comparative analysis. Asia-Pacific Journal of Regional Science, 6(2), 735–758. doi:10.1007/s41685-022-00236-9.

[32] Mathur, S. K. (2017). Effects of Corruption & FDI on Income Inequality: Empirical Investigation. Final Report, IIT Kanpur, India, 1-14.

[33] Van Bon, N. (2019). The Role of Institutional Quality in the Relationship between FDI and Economic Growth in Vietnam: Empirical Evidence from Provincial Data. The Singapore Economic Review, 64(03), 601–623. doi:10.1142/s0217590816500223.

[34] Nguyen, H. T., Vo, T. H. N., Le, D. D. M., & Nguyen, V. T. (2020). Fiscal Decentralization, Corruption, and Income Inequality: Evidence from Vietnam. The Journal of Asian Finance, Economics and Business, 7(11), 529–540. doi:10.13106/jafeb.2020.vol7.no11.529.

[35] Teixeira, A. A. C., & Loureiro, A. S. (2019). FDI, income inequality and poverty: a time series analysis of Portugal, 1973–2016. Portuguese Economic Journal, 18(3), 203–249. doi:10.1007/s10258-018-00152-x.

[36] Kim, S., & Choi, B. (2020). The impact of the technological capability of a host country on inward FDI in OECD countries: The moderating roles of institutional quality. Sustainability (Switzerland), 12(22), 9711. doi:10.3390/su12229711.

[37] de Haan, J., & Sturm, J. E. (2017). Finance and income inequality: A review and new evidence. European Journal of Political Economy, 50, 171–195. doi:10.1016/j.ejpoleco.2017.04.007.

[38] Wooldridge, J. M. (2013). Correlated random effects panel data models. IZA Summer School in Labor Economics. Michigan State University, East Lansing, United States. Available online: https://www.iza.org/conference_files/SUMS_2013/slides_2_nonlin_iza.pdf (accessed on November 2023).