China-USA Business Review, Jan.-Mar. 2025, Vol. 24, No. 1, 29-43
doi: 10.17265/1537-1514/2025.01.003

Relationship Between Foreign Direct Investment and Economic Growth: What Is the Role of Financial Development? An Empirical Study for 10 Asian Countries

Rajab Bouzayani, Zouheir Abida
University of Sfax, Sfax, Tunisia

The complementary relationship between foreign direct investment (FDI), financial development, and economic growth which is an important element in promoting economic growth and sustainable development is part of a more attractive and sought-after discussion. This paper focuses on the mediating role of financial development in the effect of foreign direct investment on economic growth by processing a database of a sample of 10 Asian countries over the period from 2000 to 2022. The interest of this study is to establish the maximum threshold of financial development that guarantees the positive returns related to foreign direct investment, taking into account that the banking sector and the stock market reflect financial development indicators. The results of the econometric technique generalized method of moments (GMM) and the threshold regression (TR) show a minimum threshold of financial development of 82.21% for the index of the banking sector and 27.24% for the stock market index. In addition, this study justifies the significant positive contribution of foreign direct investment to economic growth before and after the determination of the regression threshold. However, this effect becomes more important when the threshold of financial development exceeds a defined level. This is true when financial development is measured both through the banking sector and the stock market. It is therefore important for the 10 countries in question to cap the financial system thresholds at agreed milestones in order to fully reap the benefits of foreign direct investment.

Keywords: FDI, banking sector, stock market, economic growth, GMM, TR

Introduction

The optimal allocation of foreign resources requires a minimum level of domestic development in the host countries, including financial development. To this end, economists and politicians have focused on financial development strategies so that foreign direct investment (FDI) can play its full role as a factor in economic growth and development.

On the one hand, the contribution of foreign direct investment to the increase in the level of growth is channelled through different channels. In this respect, we can cite: the encouragement of domestic investment in host countries (Kamil & Bazoumana, 2018; Kurbanov, 2020), the encouragement of exports (Dukhbandhu &

Rajab Bouzayani, Doctor, Faculty of Economics and Management of Sfax, University of Sfax, Sfax, Tunisia.
Zouheir Abida, Doctor, Faculty of Economics and Management of Sfax, University of Sfax, Sfax, Tunisia.
Correspondence concerning this article should be addressed to Rajab Bouzayani, Sfax, Tunisia.

Maathai, 2003; Herzer, Stephan, & Felicitas, 2008; Manoj & Titiksha, 2020), and consequently the improvement of the trade balance, the transfer of new technologies to physical capital (Haini, Lim, & Loon, 2024; Malikane & Chitambara, 2017), the transfer of new knowledge to human capital and therefore the increase in labour factor productivity (Su & Liu, 2016; Anetor, 2020; Dankyi, Boadi, Olivier, & Yusheng, 2022; Huay, Arabi, & Cheng, 2024), and the creation of new jobs (Kaulihowa & Adjasi, 2018) improving social welfare (Keita & Baorong, 2022; Lonel Sergiu et al., 2024). The combination of these factors can affect economic growth and development.

Moreover, the view of foreign investors is determined by the level of development of the receiving countries such as human capital development (Su & Liu 2016), institutional framework development (Adegboye et al., 2020; Shittu, Yusuf, El Houssein, & Hassan, 2020), financial development (My-Linh, 2022; Bouzayani & Abida, 2021), the high degree of trade openness and financial and economic integration, availability of natural resources, etc. Indeed, these can save the profitability of foreign direct investment.

On the other hand, financial development facilitates the processes of economic growth and development. That is, it ensures the financing of investment projects through the removal of ceilings related to loans granted to the private sector (Sekali, 2018). Again, financial development encourages economic growth as a result of interest rate liberalization. This means that it encourages funding agents to deposit their funds with financial institutions for higher returns (McKinnon, 1973; Shaw, 1973). This situation accumulates resources and facilitates the means of financing. In addition, the development of the financial system anticipates risks and manages the problems of contagion and volatility of short-term capital flows (Kpégo & Anatole, 2018; Pradhan, Arvin, Bahmani, & Hall, 2019). Indeed, the availability of resources and means of financing investment projects, the high degree of anticipation of risks and good risk management stimulate growth.

As to the factors explaining the increased effect of foreign direct investment on economic growth in host countries, it is said that the effect of foreign direct investment depends on the degree of technological gap (Malikane & Chitambara, 2017; Haini et al., 2024; William & Erasmus, 2023), quality of manpower (Veasna, Sun, & Anwar, 2017; Bouzayani & Abida, 2023; Anetor, 2020), type and reflux of foreign resources (Chen et al., 2024), and financial development (Rosa & Rui, 2013; Rudra, Mak, & John, 2019; My-Linh, 2022; An, Chen, & Yeh, 2023).

In addition, the library of academic research studies is not rich in analysis and determination of the threshold of financial development that can guarantee the positive impact of foreign direct investment on economic growth. Indeed, this study deals with and establishes the mediator threshold of financial development under the “banking sector” index and the “stock market” in the allocation of the positive effect of foreign direct investment on economic growth.

The remainder of this paper is organized as: Part II presents an overview of theoretical and empirical literature that explains the nature of the relationship between FDI, financial development, and economic growth. The third part of the script models and examines the data. As for the fourth part, it discusses the results. The fifth part is devoted to the conclusions and recommendations.

Overview of the Theoretical and Empirical Literature

The bilateral relationship between foreign direct investment and growth has been discussed and interpreted for a long time. Indeed, the results of empirical research have accepted the hypothesis that foreign direct investment contributes significantly to growth and economic development. However, others have refused. In

this context, reviews of theoretical and empirical literature have explained the link between foreign direct investment and economic growth through export promotion. In this regard, Herzer et al. (2008) emphasized the causal relationship between capital flows in the form of foreign direct investment and economic growth in 28 countries from 1970 to 2003 through the Granger co-integration test. Indeed, the results justify the long-term equilibrium relationship between FDI and growth with the exception of Ecuador, Mexico, Venezuela, and Sri Lanka. They also showed that in the long term, FDI's effect on growth is positive and statistically significant. This contribution is explained by the location of exporting companies in host countries, which encourages exports and consequently economic growth.

Again, previous studies have noted that the inflow of foreign capital flows affects the increase in the level of gross domestic product and improves social well-being. In this perspective, Keita and Baorong (2022) tested the link between foreign direct investment and social welfare for the Guinean economy from 1990 to 2017. They showed that foreign direct investment has a significant positive effect on the well-being of Guineans in both the short and long term. In addition, they found that it is important for Guinean decision-makers to implement strategies of attracting foreign resources to see more growth and development and improve well-being.

In addition, based on empirical studies, foreign direct investment has been identified as a key factor for inclusive economic growth. In this regard, Onuogu et al. (2024) examined the relationship between information and communication technology diffusion, foreign direct investment, trade opening, and economic globalization on growth for 48 countries of sub-African Saharan from 2005 to 2020 by the generalized method of moments (GMM). They showed that foreign direct investment has a significant positive impact on inclusive growth. This impact is explained by the foreign direct investment which brings new knowledge. So, this operation can generate to the increase in the level of labor productivity and consequently growth.

Apart from the positive spin-offs of FDI, it can threaten the economic growth processes in host countries. In this regard, Milon, Quazi, and Pradhan (2024) emphasized the nature of the effect of foreign direct investment, foreign aid, and transfer income on short- and long-term economic growth in Bangladesh. They used the Autoregressive Distributed Lag (ARDL) integration model for time series from 1976 to 2019. The regression results noted that foreign direct investment supports long-term economic growth. But in the short term it negatively affects the level of growth. Indeed, they explained that the negative effect by the entry of foreign direct investment can disrupt the macroeconomic framework in particular, bring economic instability and consequently the low level of growth.

In addition, recent studies have noted that foreign direct investment can hinder growth in host countries due to the high degree of competition with small and medium-sized enterprises. In this context, Hasan, Siddiqui, and Arsalan (2024) sought to address the impact of foreign capital inflows on the development of stock markets in a sample of 28 emerging countries over the period 1998-2022. They have shown that international remittances and portfolio investments have a significant positive effect on the development of stock markets. This allocation is explained by the inflow of remittances, which improve the availability of financial resources in the economy and therefore promote growth and stability in stock markets. They also interpreted the positive effect of portfolio investment by increasing stock market liquidity and closing the savings and investment gap in the host country. However, the results showed that foreign direct investment has a significant negative effect on stock market development. In fact, the negative effect of FDI is explained by the entry of FDI which can divert investments from the stock market to other companies, repatriating

profits and foreclosure effects on domestic investment by creating strong competition in the input market, which would make it difficult for domestic listed companies.

Moreover, previous studies have shown that FDI not only hampers economic growth but can threaten financial development. In this context, Qamri, Sheng, Adeel-Faroog, and Alam (2022) discussed the mediating role of financial development and economic growth in the relationship between foreign direct investment and environmental degradation for 21 Asian countries over the period 1980-2018. The results show that FDI has a significant positive impact on environmental quality. This effect is explained by the entry of FDI which reduces the level of pollution. They also noted that financial development and economic growth have a negative impact on the quality of the environment. On the other hand, they have shown that foreign direct investment has a significant negative influence on economic growth and financial development. So, in light of these results, Qamri et al. (2022) invited the 21 countries concerned to focus on foreign direct investment flows and reduce economic instability so that financial resources can be distributed evenly across the industrial sector and nations can achieve a clean business environment.

Finally, on the link between foreign direct investment and economic growth, we see that FDI is often seen as a driver of growth and development in nations. It promotes the transfer of new technologies, knowledge, encourages domestic investment, exports, and innovation, and creates new jobs. But a more nuanced analysis reveals an inverse relationship. This indicates that a massive influx of capital flows can undermine growth by exacerbating economic independence, diverting resources from domestic firms, or creating unfair competition. Moreover, the concentration of FDI in sectors can be innovative; it can slow down the development of local industries.

With regard to the role of financial development in the dynamics of growth and economic development, we can say that based on the results of academic research, it studies that financial development plays a crucial role in creating growth and wealth. It facilitates access to credit and improves the efficiency of financial markets. It enables companies to invest in innovative projects to increase productivity. Again, the development and strength of the financial system encourages savings and mobilizes resources to fund funding-hungry agents to stimulate employment and consumption. In this regard, Nosheen, Abbasi, and Iqbal (2024) sought to examine the effect of trade openness, human capital and financial development on economic growth in South Asia from 1980 to 2019 by the Nonlinear Autoregressive Distributed Lag (NARDL). The results show significant short- and long-term effects, with an asymmetric dynamic. This means that the linear ARDL model results show a positive correlation between financial development and economic growth for Pakistan and India. However, this result is not justified for Bangladesh. The strong positive correlation between financial development and growth is explained by the development of the financial system that finances productive investment projects, which guarantees long-term economic efficiency.

Again, the findings of previous studies have noted that a strong financial system encourages savings and mobilizes resources to finance investment projects. In this regard, Adegboyega, Oladeji, Folorunso, and Olofin (2024) used secondary data from global development indicators to address the relationship between international capital flows, financial development, and economic growth in sub-Saharan African (SSA) countries from 1990 to 2019. Indeed, the results of Transverse Augmented Autoregressive Distributed Lag (TA-ARDL) show that financial development has a positive effect on economic growth in SSA countries in the long term but not in the short term. This result is explained by the financial system of SSA countries effectively responding to domestic sector needs. In addition, remittances and foreign debt flows have a positive and

statistically significant impact. However, foreign direct investment and foreign portfolio investment have a statistically insignificant effect on economic growth. They explained this result by the poor preparation of the prerequisites for the entry of foreign resources.

Further, previous research notes that financial development encourages access to resources and technology. This operation can generate an increase in energy consumption since investments in infrastructure and industry stimulate energy production and demand. In this perspective, Samour, Baskaya, and Tursoy (2022) focused on the nature of the effect of financial development, economic growth, and FDI on renewable energy consumption for the United Arab Emirates (UAE) over the period 1989 to 2019. They used the "bootstrap" technique of distributed autoregressive offset and Granger's causality analysis. The results justify that the entry of FDI, the level of economic growth, and financial development can lead to a significant improvement in renewable energy consumption in the UAE. They also found that it is important for UAE officials to develop more of the financial system to avoid financial risks that can threaten the stability of financial markets and reduce renewable energy consumption.

In light of previous research on financial development and economic growth, the increase in short-term economic growth is influenced by a variety of factors, including stock market developments. In this regard, Cisse, Teme, Keita, and Sönmez (2024) highlighted the link between the regional stock exchange and economic growth in Mali through the use of monthly data from January 2009 to December 2020. Indeed, the regression results of the Autoregressive Distributed Lag (ARDL) and a Vector Error Correction (VEC) model suggest a significant long-term relationship between stock market development and economic growth in Mali. They noted that inflation and capital flows have a negative effect, while market capitalization and the BRVM (Bourse Régionale des Valeurs Mobilières) composite index have a positive but not significant impact on economic growth. They found that it is important for Mali to further develop the financial system in order to allocate foreign resources effectively and to control inflation in order to encourage growth.

On the other hand, the complementarity between FDI and financial development plays an important role in improving economic growth and development. Indeed, the development of financial markets in host countries facilitates access to capital and offers appropriate financial instruments which attract more foreign resources. Moreover, foreign investors are more likely to invest in climates where they can easily access financing and good quality financial services. In this regard, Pandey, Shrestha, and Acharya (2024) examined the distinctive links between foreign capital inflows, financial sector developments, and economic expansion in Nepal through the Augmented Autoregressive Distributed Lag (ARDL) boundary test method and the Error Correction Model (ECM). They used the financial development index, the financial institutions index, and the financial markets index as alternative indicators of financial developments. Results show a strong positive effect of financial development and FDI on improving economic output in Nepal. This effect is explained by the development of the financial system in Nepal. That is, it directs foreign resources to productive sectors. In addition, short- and long-term analyses are reliable, with no problems such as heteroscedasticity, autocorrelation and multicollinearity. They noted that the dynamic between FDI, financial development, and economic growth is returning to a state of equilibrium in the long term.

As for My-Linh (2022), he sought to determine the role of the banking sector and the stock market in strengthening the effect of FDI on economic growth of a sample of six countries belonging to South East Asia from 2002 to 2019 by the generalized method of moments and the threshold regression. He explained the significant positive impact of FDI, banking, and stock market on economic growth. In addition, they have set a

minimum threshold for the banking sector and the stock market of 85.64% and 21.95%, respectively. Based on these results, My-Linh (2022) found that it is important for the countries in question to further develop the stock market so that FDI can fully play its role as a driver of economic growth.

In addition, the strengthening of the effect of foreign resources on economic growth requires a minimum threshold for financial development in the recipient countries. In this regard, An et al. (2023) examined the role of financial development in enhancing the impact of foreign direct investment in emerging and developing countries in Asia from 1996 to 2019 through econometric technique Panel Smooth Transition Regression (PSTR) model and by the threshold regression. The results justify that two finance development thresholds mediate the nonlinear contribution of FDI to economic growth. That is, beyond a certain level, financial development improves the contribution of FDI, but very high levels of financial development will not encourage foreign investment to benefit growth. In addition, they show that the moderating effect of financial institutions between FDI and growth is more important than that of financial markets. Thus, the nature of the relationship between FDI and growth takes an inverted U-shape. This signals the positive effect of foreign resources associated with the accessibility and efficiency of the financial system. However, An et al. (2023) found that it is important for the countries concerned to improve access and efficiency of the financial system in order to enhance the potential benefits of FDI.

Finally, from the complementarity between financial development, foreign direct investment, and economic growth, we see that studies confirm that the interaction between financial development and FDI reinforces the significant contribution of FDI to economic growth, notably My-Linh's (2022) and An et al.'s (2023) study. However, other studies like have overlooked this confirmation. So the question is: Why is this contradictory? Otherwise, what level of financial development does it guarantees the potential benefits associated with the inflow of foreign resources?

Estimation Method and Data

Estimation Method

The econometric model of this research study establishes the threshold (ω) for financial development, in which the allocation of foreign direct investment on economic growth may change when financial development exceeds the threshold (ω). Indeed, the econometric Model 1 is inspired by the work of Ibhagui (2019) and Osei and Kim (2020) which is written as:

$$TGDP_{it} = \alpha + \beta_1 FDI_{it}\ I\ (FD_{it} \leq \omega)\ + \beta_2 FDI_{it}\ I\ (FD_{it} \geq \omega) + \ \delta\ CV_{it}\ + \varepsilon_{it} \quad (1)$$

with:

GDP: Economic growth. It is measured as GDP per capita growth.

FDI: Foreign direct investment. It is measured as the percentage ratio of FDI net inflows in the reporting economy to GDP.

FD: Financial development. It is determined through domestic credit and market capitalization. In fact:

- Domestic credit is noted (FD1). It is measured by bank credit granted to the private sector (% of GDP).
- Market capitalization is noted (FD2). It is measured by the sum of the values of the outstanding common and preferred shares of a publicly traded company.

CV: A set of control variables. It contains human capital (HK), trade openness (TOP), government consumption expenditure (GXP), inflation (INF), and economic freedom (EF). Indeed:

Human capital is noted. It is measured by the secondary school enrollment (% gross). Trade openness is noted. It is computed as the percentage ratio of sum of exports plus imports of goods to total output. Government consumption expenditure is noted. It consists of total expenses and the net acquisition of non-financial assets (% of GDP). Inflation is measured by the consumer price index which reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services. It is noted. The economic freedom index contains the size of government, legal system and degree of security of private property rights, currency, degree of freedom of trade and regulation. Each indicator contains other indices. In total, the "economic freedom" index contains 42 distinct variables each of which is scored between 0 and 10. It is noted.

And i: 1…10; t: 1…20.

In relation to the econometric models of Ibhagui (2019), Osei and Kim (2020), and My-Linh (2022) which assume a single level of financial development (ω), the econometric model of this study takes two levels of the threshold of financial development (ω_1) and (ω_2). Indeed, Model 2 is inspired by the work of Hansen (1999), Wang (2015), and My-Linh (2022).

$$TGDP_{it} = \alpha + \beta_1 FDI_{it}\ I\ (FD_{it} \le \omega_1)\ + \beta_2 FDI_{it}\ I\ (\omega_1 < FD_{it} \le \omega_2) + \beta_3 FDI_{it}\ I\ (FD_{it} \ge \omega_2) + \delta\ CV_{it}\ + \varepsilon_{it} \quad (2)$$

with:

(ω_1) and (ω_2) are two financial development threshold values.

Indeed, (ω_1) and (ω_2) can determine the threshold of financial development under both indices. That is, (ω_1) presents the banking sector threshold and (ω_2) presents the financial market threshold in Model 1.

When the threshold j is added to each index, Model 1 becomes as follows:

$$TGDP_{it} = \alpha + \beta_1 FDI_{it}\ I\ (FD_{it} \le \omega_1)\ + \sum_{j=1}^{j=2} \beta_j\ FDI_{it}\ I\ \left[\omega_{j-1}(FD_{it} \le \omega_j)\right. + \omega_{j+1} FDI_{it}\ I\ \left.(FD_{it} > \omega_j\right] + \delta\ CV_{it}\ + \varepsilon_{it} \quad (3)$$

with:

ω_j is the threshold index of financial development.

ω_{ja} is the threshold of the banking sector.

ω_{jb} is the threshold of the financial market.

The other variables are similar in Models 1 and 2.

With respect to empirical methodology, the regression method of Hansen (1999) and Wang (2015) is based primarily on the fixed-effect regression basis in a highly balanced panel data. In addition, the regression threshold is more advantageous for determining the financial development threshold. But this method does not solve the endogeneity problem before and after the threshold determination. For this reason, this paper uses the generalized method of moments (GMM) proposed by Arellano and Bond (1991) to estimate the effect of foreign direct investment on economic growth before and after determining the threshold of financial development. Thus, through this method, this paper can overcome the estimation assumptions that they may solve the potential endogeneity problem (Doytch & Uctum, 2011).

Data

This paper analyzes data from 10 Asian countries including Turkey, Indonesia, Malaysia, Thailand, India, China, Singapore, Philippines, Vietnam, and Bangladesh over the period 2000 to 2022. These countries are

experiencing impressive economic growth. The sample database was collected during the period 2000-2022, which is before, during, and after the 2007 financial crisis. Thus, the regression results will be complete and may be appropriate to different areas of the macroeconomic framework. The sample database was collected from the source of the World Bank (2022) and Fraser Institute (2022).

Empirical Analysis

The importance of descriptive statistics of variables is the identification of the image of a macroeconomic series by the minimum and maximum value, and the mean, standard deviation, Skewness, and Kurtosis. In addition, each series is characterized by an upward, downward, or constant trend over a specific period. Table 1 presents the descriptive statistics of the variables.

Table 1

Descriptive Statistics of Variables

	GDP	FDI	FD1	FD2	HK	GXP	TOP	INF	EF
Mean	8.03	89.71	82.76	94.47	99.09	74.23	95.12	4.87	6.94
Std. dev	2.27	11.59	52.41	66.23	1.38	5.98	16.07	1.09	2.44
Minimum	4.17	12.03	19.06	0.41	94.67	43.59	57.41	-0.9	3.23
Maximum	11.10	98.45	97.18	267.91	99.33	82.36	98.72	23.42	8.73
Skewness	4.164	6.61	-5.29	6.91	-9.55	-6.09	14.42	3.77	4.67
Kurtosis	5.07	2.98	2.07	1.78	3.12	9.37	3.27	1.01	3.02
J.B	19.33	9.01	11.31	6.09	10.29	3.46	11.89	5.99	16.29
PJ.B	0.000	0.002	0.088	0.000	0.017	0.000	0.000	0.026	0.000

Note. Source: Calculated by authors using STATA 15.

The results of the descriptive statistic show that the variable “economic growth” recorded an average of 8.03 with a small standard deviation of 2.27. In fact, the minimum and maximum values range from 4.17 to 11.10. In addition, this variable takes a right-spread asymmetric distribution form because the Skewness is equal to 4.164 > 0. It is leptokurtic since the Kurtosis is equal to 5.07. In addition, the “economic growth” variable rejects the zero assumption of normality due to the fact that the *p*-value is less than 5%.

In addition, the FDI variable recorded an average of 89.71 of GDP with a standard deviation of 11.59. The minimum and maximum values are 12.03 and 98.45 respectively. In contrast, the net input of FDI takes an asymmetric distribution spread to the right because Skewness is positive. It is leptokurtic because the Kurtosis is equal to 2.98. This variable rejects the zero assumption of normality because the *p*-value is less than 5%.

For the “banking sector” variable, it recorded an average of 82.76 with a standard deviation of 52.41. Overall, the minimum and maximum values are limited to 19.06 to 97.18. In addition, this variable takes an asymmetrical form spread to the left because the Skewness is negative. It is leptokurtic since the Kurtosis is equal to 2.07. On the other hand, this variable accepts the zero assumption of normality due to the fact that the *p*-value > 5%.

In addition, the variable “stock market” averaged 94.47 with a strong standard deviation of 66.23. The minimum and maximum values are 0.41 and 267.91 respectively. On the other hand, this variable takes an asymmetric distribution spread to the right because the Skewness is positive. It is leptokurtic because the Kurtosis is equal to 1.78. Overall, this variable rejects the zero assumption of normality because the *p*-value is equal to 0.000 < 5%.

Table 2 presents the correlation matrix.

Table 2 shows that all variables are positively correlated with economic growth except inflation. Indeed, when it comes to independent variables, the "banking sector" variable is most correlated with economic growth. In addition, the stock market is least correlated with economic growth. In contrast, for the control variables, human capital is most correlated with economic growth. However, economic freedom is the least correlated variable with economic growth.

Table 2

Correlation Matrix

	GDP	FDI	FD1	FD2	HK	GXP	TOP	INF	EF
GDP	1.00	0.51 (0.00)***	0.64 (0.04)**	0.31 (0.00)***	0.82 (0.05)**	0.43 (0.00)***	0.59 (0.08)*	-0.26 (0.00)***	0.23 (0.00)
FDI		1.00	0.41 (0.00)***	0.22 (0.04)**	0.51 (0.00)***	0.08 (0.17)	0.73 (0.17)ns	-0.36 (0.32)	0.47 (0.03)**
FD1			1.00	0.03 (0.00)***	0.35 (0.02)**	0.32 (0.88)	0.71 (0.01)**	-0.44 (0.00)***	0.82 (0.01)**
FD2				1.00	-0.24 (0.00)***	0.66 (0.07)*	0.08 (0.05)**	-0.29 (0.00)***	0.23 (0.68)
HK					1.00	0.42 (0.01)**	0.68 (0.49)	0.36 (0.03)**	0.48 (0.00)***
GXP						1.00	0.03 (0.02)**	0.04 (0.05)**	0.09 (0.12)ns
TOP							1.00	-0.57 (0.00)***	0.77 (0.00)***
INF								1.00	0.01 (0.02)**
EF									1.00

Notes. The values in parentheses are the probability. *, **, and *** indicate significance at 10%, 5%, 1% levels, respectively and ns is not significant. Source: Calculated by authors using STATA 15.

Table 3 presents the regression threshold test.

Table 3

The Threshold Effect Test

Model	Effect of the banking sector on economic growth		Effect of stock market on economic growth	
	First threshold	Second threshold	First threshold	Second threshold
Threshold (ω)	82.21 [79.23, 85.37]	77.52 [58.44, 81.76]	27.24 [21.29, 33.86]	102.08 [87. 91, 111.02]
Probability	(0.00)***	(0.28)	(0.08)*	(0.19)

Notes. The values in parentheses are the probability. *, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively. Source: Calculated by authors using STATA 15.

Table 3 shows the results of the financial development threshold (ω) regression under the "banking sector" index and the "stock market" index. Indeed, the banking sector threshold (ω_1) is equal to 82.21 and the stock market threshold (ω_2) is equal to 27.24. In the case where there are several thresholds of financial development, Table 3 shows no statistical significance. This means that Models 2 and 3 are not suitable.

Model 1 also provides evidence of the effect of foreign direct investment on economic growth. For this reason, this paper tested the effect of foreign direct investment on economic growth before and after the regression of the financial development threshold ω_a and ω_b.

Table 4 presents the results of the econometric model test.

Table 4 shows that the average variance inflation factor (VIF) is low because it is 1.34. In addition, it noted that the problem of multicollinearity is not serious. But, it showed the presence of a problem of endogeneity, heterocedasticity, and autocorrelation between errors. For this reason, this paper has used the generalized method of moments (GMM) in system to overcome these defects of the model. These results are presented in Table 5.

Table 4

The Test Results of the Research Model

Model	Banking sector model	Stock market model
Autocorrelation test	167.29 (0.00)***	149.04 (0.04)**
Heteroscedasticity test	42.58 (0.00)***	74.33 (0.00)***
Tests of endogeneity	92.04 (0.05)**	29.51(0.00)***
Multicollinearity test	Mean VIF = 1.34	Mean VIF = 1.47

Notes. The values in parentheses are the probability. *, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively. Source: Calculated by authors using STATA 15.

Table 5

Estimation Result by GMM

Variable		Banking sector model	Stock market model
_cons		0.18 (0.02)**	0.36 (0.43)
FDI	In the case of domestic credit ≤ 82.21%	0.11 (0.00)***	
	In the case of domestic credit > 82.21%	0.19 (0.01)**	
	In the case of market capitalization ≤ 27.24%		0.21 (0.00)***
	In the case of market capitalization > 27.24%		0.23 (0.00)***
Human capital		0.47 (0.00)***	0.29 (0.00)***
Trade openness		0.22 (0.04)**	0.31 (0.01)**
Government consumption expenditure		0.06 (0.01)**	0.15 (0.31)ns
Inflation		-0.35 (0.00)***	-0.72 (0.05)**
Economic freedom		0.39 (0.01)**	0.04 (0.00)***
Significance level		298.19 (0.01)**	729.82 (0.00)***
Arellano-Bond test	AR(1)	-4.25 (0.14)ns	-3.57 (0.29)ns
	AR(2)	-2.83 (0.00)	-1.01 (0.00)
Sargan test		11.84 (0.96)ns	75.23 (0.61)ns

Notes. The values in parentheses are the probability. *, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively and ns is not significant. Source: Calculated by authors using STATA 15.

Table 5 shows the effect of foreign direct investment on economic growth for the banking sector model and the stock market model. That is to say, the positive impact of FDI on economic growth depends largely on the level of financial development of the host country. Indeed, for the banking sector model, the effect of foreign direct investment on economic growth is positive at 0.11 and statistically significant at 1%. This result corroborates the results of previous studies by An et al. (2023) and Sushanta, Sudhakar, and Dhananjoy (2024) and contradicts those of Appiah-Otoo, Chen, and Ampah (2023).

Indeed, when the banking sector rises above the threshold of 82.21, the effect of foreign direct investment on economic growth is equal to 0.11. In addition, if the banking sector threshold exceeds 82.21, the contribution of foreign direct investment has increased and reached a positive effect of 0.19 and statistically

significant at the 5% threshold. This means that the development of the banking sector plays a very important role in the relationship between foreign direct investment and economic growth. Otherwise, it stimulates FDI-related returns to economic growth. Furthermore, for the stock market model, FDI's contribution to economic growth is positive and significant before and after the decline. More precisely, before the determination of the threshold (27.24), the effect of FDI is positive at 0.21 and statistically significant at the 1% threshold. On the other hand, when the banking sector threshold exceeds 27.24, the FDI effect increases slightly. It becomes positive at 0.23 and statistically significant at the 1% threshold. In this case, the development of the stock market increases the effect of FDI on economic growth.

Compared to previous studies, this study is an interesting aspect because it revealed the contribution of FDI to economic growth before and after financial development. This contribution was also found in two models of financial development (the banking sector development model and the stock market model).

Table 5 shows that the contribution of FDI to economic growth increases significantly when financial development exceeds defined thresholds. This indicates that the benefits of FDI are maximized when the level of the banking sector and stock market exceeds the thresholds of ω_a and ω_b. Otherwise, when the level of the banking sector exceeds 82.21, the positive effect of FDI on economic growth increases from 0.11 to 0.19. This means that financial development through the banking sector can encourage positive FDI-related spillovers on economic growth. This allocation may be explained by the important role played by the banking sector in the 10 Asian countries in providing capital and financial services. In addition, when the FDI effect increases from 0.21 to 0.23, the equity market threshold exceeds 27.24. That is, there is a significant medium-to long-term capital supply channel, particularly for FDI firms, thus fostering economic growth.

In addition, the results noted that human capital has a positive and statistically significant effect on both cases. This result corroborates previous academic research studies by An et al. (2023) and Bouzayani and Abida (2023). Indeed, this relationship is explained by the development of human capital in the 10 Asian countries. That is, the qualification of the workforce can absorb and transfer new technologies and consequently increase productivity and economic growth.

Again, the effect of trade openness on economic growth is positive and significant at 5%. This allocation may be explained by the commitment of the 10 Asian countries to open up and use international accounting standards, which encourages export and import transactions and subsequently growth and development.

The results obtained justified the relevance of the theory of endogenous growth through the positive effect of government consumption expenditure on economic growth. This result confirms the results of previous studies by Osei and Kim (2020). This effect is explained by the government consumption expenditure which can improve economic growth and development through the strengthening of consumption and private sector investment. This means that the efficient allocation of government consumption expenditure can improve the quality of public services, which will create favourable conditions for improving the efficiency of private sector investment.

With respect to inflation, the results confirm the negative effect of inflation on economic growth. This result confirms the logic of previous studies by Shelton, Tafadzwa, and Sin-Yu (2021) and contradicts the logic of Cili and Alkhaliq (2022). Indeed, the negative effect of inflation on economic growth may be explained by the contained increase in prices which may make economic decision-making by public authorities ineffective. In addition, the high uncertainty of inflation can transform speculative economies that should produce more

than investment or real output. Again, the general increase in consumer prices can damage consumers' purchasing power. In this case, demand may decrease and therefore production.

Also, the sign associated with the variable "economic freedom" is positive and statistically significant. This means that the economic freedom of the 10 Asian countries contributes to improved economic growth. Therefore, this result corroborates the results of studies by Mihaela, Waqar, and Helian (2018). This result is explained by the good regulation of credit, labour, and goods and services markets, freedom of international trade and respect for private property rights in the 10 Asian countries. Indeed, the combination of these factors can improve investor confidence. Again, good regulation contributes to macroeconomic stability which reduces uncertainty for local investors. In this case, confidence and uncertainty among investors can encourage investment and thus economic growth.

Conclusions and Policy Implications

This paper focuses on the analysis of the role of financial development in the contribution of foreign direct investment to economic growth in a sample of 10 Asian countries over the period 2000-2020 by the threshold regression (TR) and the generalized method of moments (GMM), by measuring financial development through the banking sector and stock market. The results found that financial development plays an important role in improving the contribution of foreign direct investment to economic growth. Otherwise, the result of the threshold regression captured a threshold of 82.21% for the banking sector and a threshold of 27.24% for the stock market. Indeed, the significant positive effect of foreign direct investment was justified before and after the threshold determination. Moreover, this effect becomes stronger if financial development exceeds the defined threshold. This result is reflected when financial development is considered under the banking sector and financial market index. It can be seen that this is also an interesting finding as a great success of this study.

Again, this paper justified that the economic growth of the sample is based mainly on human capital, trade openness, government consumption expenditure, and economic freedom. Indeed, the significant allocation of human capital is explained by the qualification of the labor force it generates to the increase in productivity level and consequently economic growth. In addition, the linear relationship between trade openness and economic growth is explained by the commitment of the 10 Asian countries to open up to the outside world and subsequently obtain comparative advantages. Again, the strengthening of private sector consumption and investment following efficient allocation of public expenditure may explain the significant positive effect of government spending. Thus, the remarkable contribution of economic freedom to economic growth is explained by good regulation of credit, labour, and goods and services markets, freedom of international trade, and respect for private property rights. At the same time, it reveals the adverse effect of inflation on economic growth. Indeed, this effect is explained by the contained increase in prices and high uncertainty of inflation can threaten purchasing power, demand, and consequently the fog of economic growth.

In the light of the results and economic explanations, this paper found some important suggestions for economic and political decision-makers in the 10 Asian countries to stimulate positive spillovers related to foreign direct investment on economic growth. In particular, the authorities of these countries must focus more on financial improvement and development. That is, they aim to maintain and promote domestic credit above the threshold of 82.21% and the stock market above the threshold of 27.24%. Otherwise, they must ensure

financial development in a comprehensive way in terms of scale and efficiency so that the benefits associated with foreign direct investment stimulate growth and economic development.

In addition, the paper recommended that policy makers in the 10 Asian countries continue to focus on domestic development, human capital development, and business climate development in order to attract foreign investors. It also noted that it is important for the policy makers of these countries to propose policies capable of controlling inflation in order to ensure stability of the macroeconomic framework and thus the encouragement of economic growth.

References

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.

Adegboyega, S.-B., Oladeji, S.-I., Folorunso, B.-A., & Olofin, O.-P. (2024). New insight from cross-sectional autoregressive distribution lag on the interconnectedness among financial development, financial inflows and economic growth in sub-Saharan Africa. *International Journal of Economic Behavior, 14*(1), 95-114.

An, T.-H.-T., Chen, S.-H., & Yeh, K.-C. (2023). Does financial development enhance the growth effect of FDI? A multidimensional analysis in emerging and developing Asia. *International Journal of Emerging Markets, 20*(1), 92-134. Retrieved from https://doi.org/10.1108/IJOEM-03-2022-0495

Anetor, F. O., Esho, E., & Verhoef, G. (2020). The impact of foreign direct investment, foreign aid and trade on poverty reduction: Evidence from sub-Saharan African countries. *Cogent Economics et Fiannce, 8*(1), Article 1737347.

Anetor, F.-O. (2020). Human capital threshold, foreign direct investment and economic growth: Evidence from sub-Saharan Africa. *International Journal of Development Issues, 19*(3), 323-337.

Appiah-Otoo, I., Chen, X., & Ampah, J. D. (2023). Exploring the moderating role of foreign direct investment in the renewable energy and economic growth nexus: Evidence from West Africa. *Energy, 281*, 128346.

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *Review of Economic Studies, 58*(2), 277-297. Retrieved from https://doi.org/10.2307/ 2297968

Azman-Saini, W. N. W., Law, S. H., & Ahmad, A. H. (2010). FDI and economic growth: New evidence on the role of financial markets. *Economics Letters, 107*(2), 211-213. Retrieved from https://doi.org/10.1016/j.econlet.2010.01.027

Bouzayani, R., & Abida, Z. (2021). Private capital flows, financial development and economic growth in the North African region. *Romanian Journal of Public Affairs, 3*, 202.

Bouzayani, R., & Abida, Z. (2023). Complementarity relationship between foreign direct investment, human capital threshold and economic growth: State of the 15 least developed African countries. *Journal of the Knowledge Economy, 15*(2), 7216-7236.

Chen, X., Liu, Y. C., Zhang, Y. Q., Dong, X. Y., & Ma, C. (2024). Influential determinants of Chinese direct investment in Japan: Navigating the post-pandemic knowledge economy. *Journal of the Knowledge Economy*. Retrieved from https://doi.org/10.1007/s13132-024-01801-7

Cili, M.-R., & Alkhaliq, B. (2022). Croissance économique et inflation: Preuve de l'Indonésie. *Jurnal Ilmu Ekonom, 11*(1), 145-160. Retrieved from https://doi.org/10.15408/sjie.v11i1.19848

Cisse, B.-A., Teme, A., Keita, S., & Sönmez, Y. (2024). Macroeconomics dynamics: Exploring the impact of stock market development on economic growth in Mali. *SN Bus Econ, 5*, Article 21.

Dankyi, A., Boadi, A., Olivier, J., & Yusheng, K. (2022). Human capital, FDI and economic growth: Evidence from ECOWAS in a decomposed income level panel. *Environmental Challenges, 9*, 100602.

Doytch, N., & Uctum, M. (2011). Does the worldwide shift of FDI from manufacturing to services accelerate economic growth? A GMM estimation study. *Journal of International Money and Finance, 30*(3), 410-427. Retrieved from https://doi.org/10.1016/j.jimonfin.2011.01.001

Dukhbandhu, S., & Maathai, M. (2003). Economic growth in India: Does FDI inflow matter. *The Singapore Economic Review, 48*(2), 151-171.

Haini, H., Lim, G., & Loon, P. W. (2024). Does FDI source matter for growth? Evidence from Asian FDI inflows in ASEAN countries. *Journal of the Knowledge Economy, 15*, 17726-17750. Retrieved from https://doi.org/10.1007/s13132-024-01851-x

Hansen, B. E. (1999). Threshold effects in non-dynamic panels: Estimation, testing, and inference. *Journal of Econometrics, 93*(2), 345-368. Retrieved from https://doi.org/10. 1016/S0304-4076(99)00025-1

Hasan, M.-A., Siddiqui, A-A., & Arsalan, M. (2024). The moderating role of institutional quality in the relationship between FCI and stock market development: A panel data analysis. *Journal of Economic Impact, 6*(2), 147-154.

Herzer, D., Stephan, K., & Felicitas, N. L. (2008). A la recherche d'une croissance tirée par l'IDE dans les pays de développement: La voie à suivre. *Modélisation économique, 25*, 793-810.

Huay, C.-S., Arabi, N.-A., & Cheng, C.-S. (2024). The nexus between FDI and economic growth in Malaysia. *Information Management and Business Review, 16*(3), 285-294.

Ibhagui, O. (2019). How does foreign direct investment affect growth in sub-Saharan Africa? New evidence from threshold analysis. *Journal of Economic Studies, 47*(1), 149-181. Retrieved from https://doi.org/10.1108/JES-06-2018-0198

Kamil, M., & Bazoumana, O. (2018). Foreign direct investment and economic growth: Exploring the transmission channels. *Economic Modeling, 72*, 296-305.

Kaulihowa, T., & Adjasi, C. (2018). FDI and income inequality in Africa. *Oxford Development Studies, 46*(2), 250-265.

Keita, O., & Baorong, Y. (2022). Foreign direct investment and economic growth nexus: Empirical insight from Guinea. *Asian Economic and Financial Review, 12*(1), 58-69. Retrieved from https://doi.org/10.18488/5002.v12i1.4407

Kpégo, D., & Anatole, G. (2018). Modélisation de la prévision du stress financier du système bancaire des pays de l'UMOA: Evidence empirique du rôle des facteurs institutionnels. *African Development Review, 30*(3), 264-277.

Kurbanov, O. (2020). Foreign direct investment and domestic investment on the economic growth of the Uzbekistan—A VECM analysis. Архив научных исследований.

Lonel Sergiu, P., Gina, L., Carmen, S., Dragos, H., & Alina, F-S. (2024). Gender-specific consequences of foreign direct investment on wage dynamics in Croatia: A global management perspective. *Administrative Science, 14*(9), 198. Retrieved from https://doi.org/10.3390/admsci14090198

Malikane, C., & Chitambara, P. (2017). Foreign direct investment, productivity and the technology gap in African economies. *Journal of African Trade, 4*(1-2), 61-74.

Manoj, K., & Titiksha, D. (2020). Determinants of economic growth in India: A time series perspective. *Theoretical and Applied Economics, XXVII*(2), 263-280.

McKinnon, R. (1973). *Money and capital in economic development*. Washington, D.C.: Brookings Institution.

Mihaela, P., Waqar, A., & Helian, X. (2018). The impact of institutional quality on foreign direct investment inflows: Evidence for developed and developing countries. *Economic Research Ekonomska Istraživanja, 31*(1), 626-644.

Milon, I.-H., Quazi, R.-M., & Pradhan, M.-A.-H. (2024). The impact of foreign capital inflow on economic growth in Bangladesh. *Journal of Economic Cooperation et Development, 45*(2), 145-176.

My-Linh, T. N. (2022). Foreign direct investment and economic growth: The role of financial development. *Cogent Business & Management, 9*(1), Article 2127193. doi:10.1080/23311975.2022.2127193

Nosheen, M., Abbasi, M.-A., & Iqbal, J. (2024). Asymmetric effects of trade openness, financial development and human capital on economic growth in South Asia. *The International Trade Journal*, 1-28. Retrieved from https://doi.org/10.1080/08853908.2024.2397966

Olorogun, L.-A., Salami, M.-A., & Bekun, F.-V. (2022). Revisiting the nexus between FDI, financial development and economic growth: Empirical evidence from Nigeria. *Journal of Public Affairs, 22*(3), e2561.

Onuogu, I.-C., Hassan, A., Akadiri, S.-S., Bello, A.-A., & Riti, J. S. (2024). Impact of ICT diffusion, FDI, trade openness and globalization on growth in sub-Saharan Africa. *Natural Resources Forum.* Oxford, UK: Blackwell Publishing LTD.

Osei, M. J., & Kim, J. (2020). Foreign direct investment and economic growth: Is more financial development better? *Economic Modelling, 93*, 154-161. Retrieved from https://doi. org/10.1016/j.econmod.2020.07.009

Pandey, A., Shrestha, Z., & Acharya, K.-R. (2024). Financial development and FDI impact on economic growth: Evidence from Nepal. *International Journal of Innovation in Nepalese Academia, 3*(1), 123-148.

Pinshi, C. (2017). Boucle rétroactive entre la volatilité des flux de capitaux et la stabilité financière: Résultat pour la République démocratique du Congo. *MPRA Papier 78051*.

Pradhan, R., Arvin, M.-B., Bahmani, S., & Hall, J.-H. (2019). Atteindre la croissance économique grace au développement financier et à l'investissement direct étranger. *Journal of Economic Studies, 46*(6), 1201-1223. Retrieved from https://doi.org/10.1108/JES-04-2018-0136

Qamri, G.-M., Sheng, B., Adeel-Faroog, R.-M., & Alam, G.-M. (2022). The criticality of FDI in environmental degradation through financial development and economic growth: Implication for promoting the green sector. *Resources Policy, 78*, 102765.

Rosa, F., & Rui, M. (2013). The effect of FDI on the host country's economic growth: Theory and empirical evidence. *The Singapore Economic Review, 58*(3). doi:10.1142/S0217590813500173

Rudra, P., Mak, B., & John, H. (2019). The nexus between economic growth, stock market depth, trade openness and FDI: The case of ASEAN countries. *The Singapore Economic Review, 64*(3), 461-493.

Samour, A., Baskaya, M.-M., & Tursoy, T. (2022). The impact of financial development and FDI on renewable energy in the UAE: A path towards sustainable development. *Sustainability, 14*(3), 1208.

Sekali, J. (2018). D éveloppement financier et croissance économique: Le cas du Maroc (MPRA paper, University Library of Munich).

Shaw, E. S. (1973). *Financial deepening in economic development.* New York: Oxford University Press.

Shelton, M., Tafadzwa, M., & Sin-Yu, H. (2021). Inflation, inflation uncertainty and the economic growth nexus: An impact study of South Africa. *MethodsX, 8*, 101501.

Shittu, W. O., Yusuf, H. A., El Houssein, A. E. M., & Hassan, S. (2020). The impacts of foreign direct investment and globalisation on economic growth in West Africa: Examining the role of political governance. *Journal of Economic Studies, 47*(7), 1733-1755.

Sobhee, S. K. (2016). The effects of bad institutions on economic growth, investigating the case of Latin American and sub-Saharan economies prior to the world economic downturn. *SSRN Electronic Journal.*

Su, Y., & Liu, Z. (2016). The impact of foreign direct investment and human capital on economic growth: Evidence from Chinese cities. *China Economic Review, 37*, 97-109.

Sushanta, K., Sudhakar, P., & Dhananjoy, D. (2024). The trend of FDI inflows and impact on the Indian economy. *Theoretical and Applied Economics, 31*(2), 67-86.

Veasna, K., Sun, S., & Anwar, S. (2017). FDI and human capital in developing countries: A panel data approach. *Economic Change and Restructuring, 50*, 341-365.

Wang, Q. (2015). Fixed-effect panel threshold model using Stata. *The Stata Journal, 15*(1), 121-134. Retrieved from https://doi.org/10.1177/1536867X1501500108

William, O., & Erasmus, O. (2023). Foreign direct investment, technological transfer, employment generation and economic growth: New evidence from Ghana. *International Journal of Emerging Market.* Retrieved from https://doi.org/10.1108/IJOEM-02-2022-0200