



Impact Of Financial Development On Investment: Evidence From Asian Nations

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Abstract

Research on the relationship between financial development and investment is limited. In fact, it is difficult to measure financial development because it is a broad concept with many aspects. The evidence on the impact of financial development on investment is controversial, and there is no clear consensus on this issue. This study explores the complex relationship between financial development, foreign direct investment (FDI) and domestic investment in Asian countries from 2000 to 2020. Panel regression results by STATA 14 implementation shows financial market depth, financial institution efficiency and financial market accessibility. have all contributed to financial development. Trade openness also has an impact on investment and commercialization policies of countries, contributing to attracting foreign investment capital. Savings and investment always have a close relationship with each other in a positive direction regardless of economic conditions. It shows that policymakers can build the policies that are more likely to achieve desired economic outcomes through investment and financing channels, while helping the Government implement policies that promote regional and global trade and economic growth strategies through improving aspects of the financial system.

Research purpose:

This study critically explores the complex relationship between financial development, foreign direct investment (FDI) and domestic investment in Asian nations from 2000 to 2020.

Research motivation:

Financial development and investment are vital components of economic growth, particularly in Asia from 2000 to 2020.

Empirical evidence highlights the profound impact of financial development on investment decisions, facilitating access to external finance and streamlining transactions. However, the correlation between financial development and investment isn't always straightforward.

Research design, approach, and method:

The dataset was constructed from reliable sources such as the World Bank and the International Monetary Fund (IMF). The research group aggregated the raw data related to financial development and investment in forty-eight Asian countries during the period 2000 - 2020 based on theoretical models. Then the research group selected and retained appropriate data while discarding observations with missing information. The research team presents the hypothesis that the intercept term β_0 remains constant over time, and the slope coefficients are fixed both across space and time. This hypothesis is applied to three common models in panel data analysis: Pooled Ordinary Least Squares (Pooled OLS), Fixed Effect Model (FEM), and Random Effect Model (REM). Regression with panel data was implemented in this study.

Main findings:

Panel regression results by STATA 14 implementation shows financial market depth, financial institution efficiency and financial market accessibility. have all contributed to financial development. Trade openness also has an impact on investment and commercialization policies of countries, contributing to attracting foreign investment capital. Savings and investment always have a close relationship with each other in a positive direction regardless of economic conditions.

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Practical/managerial implications:

Policymakers can design policies that are more likely to achieve desired economic outcomes through investment and financing channels, while helping the Government implement policies that promote regional and global trade and economic growth strategies through improving aspects of the financial system.

Keywords: financial development, foreign direct investment, domestic investment, regression models

1. INTRODUCTION

Financial development and investment are vital components of economic growth, particularly in Asia from 2000 to 2020. This period saw significant economic shifts, emphasizing the need to understand their interplay for sustainable development. Empirical evidence highlights the profound impact of financial development on investment decisions, facilitating access to external finance and streamlining transactions. However, the correlation between financial development and investment isn't always straightforward.

The essence of a robust financial system remains consistent across nations, enabling smoother transactions and informed investment decisions. The OECD Development Centre's 2022 report stressed the importance of broadening financial options and liberalizing capital markets for sustainable economic recovery in Asia. Our study, inspired by Pham and Gan (2022), reveals a two-way relationship between foreign direct investment (FDI) and financial development in Asian economies, especially regarding banking and stock market development thresholds.

Existing research often overlooks non-banking financial intermediaries and broader aspects of financial development, such as political and institutional relationships. To bridge this gap, our research adopts a nuanced framework, considering variables like financial depth, accessibility, efficiency, and stability. This holistic approach provides a comprehensive understanding of a well-functioning financial system.

The Asian nations are considered as the potential place for global investment. In particular, ASEAN continues to record its third consecutive year of growth with a 1.2 per cent increase to reach \$226.3 billion in 2023 in the global context of a decline in foreign direct investment (FDI) (VnEconomy, 2024). However, there has not been much research critically evaluating the impact of financial development on investment in enhancing the economic growth. Therefore, the research group hope to give further empirical results to fill the gap. Our research focuses on the impact of Financial Development on Investment with the case of Asian Countries in the Period 2000-2020, aiming to elucidate the causal relationship between financial development and investment, propose solutions for optimizing the financial sector's contribution to economic growth, and highlight its pivotal role in attracting investment and fostering prosperity.

By employing various research methods, including descriptive statistical analysis and regression analysis using STATA14 software with data from the World Bank, we aim to determine how financial development influences investment and propose recommendations to improve the financial environment for increased capital flows. Policymakers can design policies that are more likely to achieve desired economic outcomes through investment and financing channels, while helping the Government implement policies that promote regional and global trade and economic growth strategies through improving aspects of the financial system.

The paper is organised as follows: Section 2 offers literature review for readers, Section 3 gives a description of research design, approach and method, Section 4 discusses empirical results, and Section 5 makes a conclusion and give recommendations.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT**2.1 Theoretical overview of financial development**

According to World Bank (2016), financial development has a crucial part in economic growth. It helps to boost the national economy by facilitating and encouraging the inflows of foreign capital, as well as optimizing the allocation of capital. Those nations with well-structured financial systems tend to develop better and be more sustainable. Financial sector development can help with the growth of small and medium sized enterprises (SMEs) by providing them with access to finance. SMEs are typically labour intensive and create more jobs than do large firms. They become the key features in economic development, particularly in emerging economies (World Bank, 2016). This is quite consistent and strengthen the significant part of financial development in accessing the capital for SMEs shown by Nguyen et al. (2012). Gregory (2011) argues that the financial system is a mechanism within the economy designed to balance savings and investments. In the pursuit of long-term economic growth, savings and investment play pivotal roles. A country boasting a high savings rate as a percentage of GDP tends to accumulate more capital, which, in turn, fosters enhanced labour productivity and living standards.

Financial institutions can be broadly categorized into financial markets and financial intermediaries. Financial markets facilitate direct exchanges between savers and borrowers, with the stock and bond markets being pivotal components. Financial intermediaries, on the other hand, indirectly facilitate capital exchanges by connecting savers with borrowers. Noteworthy examples include banks and mutual funds.

Financial infrastructure encompasses the organizations and elements that support financial market operations. These include regulatory frameworks governing payment systems, financial sector oversight authorities, mortgage registries, and credit information agencies. Consequently, the development of the financial system intertwines closely with investment and savings, serving as a significant driver of overall economic development.

The World Economic Forum, in an Economic Working Paper, identifies seven factors characterizing key aspects of financial development. These include the business environment, institutional environment, banking and financial services, non-bank financial services, financial markets, financial stability, and financial access. The measurement of financial development involves constructing indicators based on conceptual foundations. The World Bank identifies approximately 100 indicators, with Levine (2005) cautioning that their selection can significantly impact research outcomes.

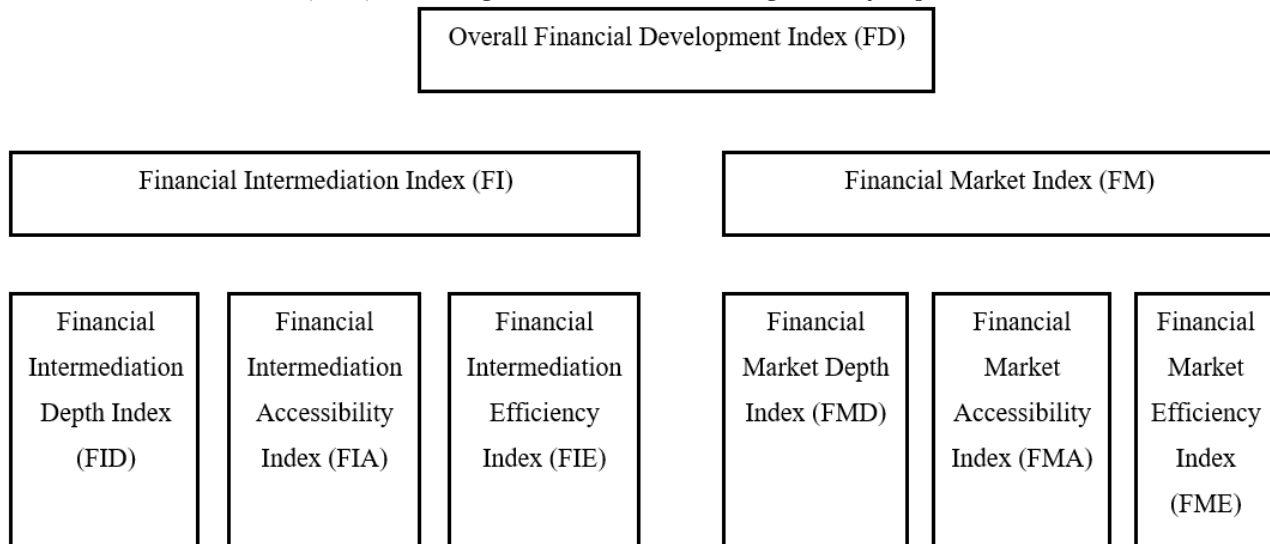


Figure 1. The FD index set measures financial development of the IMF

Source: IMF

2.2. Investment theory

There are three main theories of investment take on the optimization behaviour on behalf of the investor (decision-maker). The *neoclassical* and *Tobin's* theory of investment clearly enhances profit/ value maximization. The accelerator theory of investment implicitly assumes that investment is officially decided by an optimal capital stock (Eklund, 2013).

Investment, as defined by the OECD, entails allocating current resources with the aim of achieving greater future results. This encompasses various forms of resources, such as money, natural resources, labour, or intelligence, with outcomes ranging from increased capital assets to enhanced human and intellectual resources. Investment capital encompasses both domestic (private and government) and foreign investment, further divided into foreign direct investment (FDI) and foreign indirect investment (FII), or foreign portfolio investment.

FDI involves long-term investments in foreign countries with the objective of gaining control over invested enterprises. In contrast, domestic investment stems from both state and private sector sources. State investment capital is derived from sources like the state budget and state enterprises, while private sector investment is fuelled by public savings and private enterprises. However, fully mobilizing potential capital within the non-state economic sector remains a challenge influenced by various factors, including national development levels and government policies.

2.3 The impact of financial development on domestic and foreign investment

Financial development plays a crucial role in influencing investment capital flows. As noted by Levine (2005), it significantly impacts capital accumulation and overall output productivity. Indicators such as the diversification of financial products and services, highlighted by Bencivenga and Smith (1991), foster portfolio diversification and reduce decision-making risks. Additionally, the expansion of financial markets, noted by Gurley and Shaw (1995) and Goldsmith (1969), mobilizes savings capital and promotes investments, leading to the proliferation of diverse financial products and services.

Enhancing the quantity and quality of financial intermediaries facilitates effective collection and analysis of market information, ensuring that capital is allocated to productive investments. This positively impacts both domestic and foreign investment, contributing to overall economic growth and development.

A study was conducted by Khan et al. (2020) on the moderating effect of IQ in financial relations and FDI. Research

results have shown that FDI is widely accepted as a tool to support the sustainable growth of an economy over a long period of time. Research by Lestari et al. (2022) also shows that FD has a positive and significant impact on FDI, while corruption has no statistically significant impact.

Iheonu et al. (2020) provides empirical results on the impact of financial sector development on domestic investment depending on only financial development indicators. The overall results for the region indicate that bank efficiency and large funds significantly reduce domestic investment, while domestic credit improves domestic investment only marginally. However, results by country show significant differences in the relationship between financial sector development and domestic investment.

Veselinovic et al. (2022) builds a model to evaluate the causal relationship between banking sector depth, foreign direct investment and economic growth in a sample of six Central and Eastern European countries from 2000 to 2018 and the conclusion is that a well-managed banking sector attracts more FDI, leading to high growth rates in the countries analysed.

Some other studies also show that financial development increases the impact of FDI inflows on economic growth (Seenivasan, 2014), which is also proven by Asong (2014). Choong (2012) argues that financial development creates a pathway through which economic growth is driven by FDI inflows.

Research by Bilan et al. (2018) supports that the development of financial markets in Eastern European countries has a positive impact on foreign direct investment, especially in manufacturing industries, construction and real estate, especially in emerging economies. Recent studies have also focused on the role of factors such as climate change and science, technology, and electronic information technology on FDI capital flows. There seem to be signals from previous studies on the influence of financial development on investment decisions at many levels.

Therefore, we believe that there is a correlation between financial development and foreign direct investment (FDI) and domestic investment in Asian countries, from which we develop the following hypotheses:

H1: Financial development has positive impact on foreign direct investment (FDI) in Asian nations

H2: Financial development has positive impact on domestic investment in Asian nations

3. METHODOLOGY

3.1 Data collection

The dataset was constructed from reliable sources such as the World Bank and the International Monetary Fund (IMF). The research group aggregated raw data related to financial development and investment in 48 Asian countries during the period 2000 - 2020 based on theoretical models. Subsequently, the group selected and retained appropriate data while discarding observations with missing information.

From the dataset, the authors identified two dependent variables representing investment: Foreign Direct Investment (FDI) and Domestic Investment (I), both in the form of natural logarithms. The independent variable FD was measured by indices FMD, FID, FIA, FIE, FMA, FME - components representing the level of financial development along with several other control variables inherited from previous studies. These control variables include domestic credit to the private sector by banks as a percentage of GDP, the number of branches of commercial banks, total domestic savings, inflation index as the percentage change in the consumer price index annually, trade openness (measured by the ratio of trade balance value to GDP), annual population growth rate (%), real gross domestic product obtained by taking the natural logarithm of real gross domestic product (in US dollar units, 2020 exchange rate), GDP per capita calculated as the ratio of gross domestic product to population (in US dollars). Additionally, the authors introduced dummy variables into the model: dummy variables for periods before and after economic recession, dummy variables for time before and after joining the WTO, and dummy variables for country groups based on income levels.

3.2 Research Methods

In this study, the research team presents the hypothesis that the intercept term β_{0it} remains constant over time, and the slope coefficients are fixed both across space and time. This hypothesis is applied to three common models in panel data analysis: Pooled Ordinary Least Squares (Pooled OLS), Fixed Effect Model (FEM), and Random Effect Model (REM). In the case of the model with constant coefficients, the slope coefficients and intercept term are fixed. Therefore, when not considering the specific effects of space or time, all cross-sectional and time-series data can be pooled together, and ordinary least squares regression or Pooled OLS can be performed, as represented by the equation:

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \dots + \beta_n X_{nit} + u_{it} \quad (3.1)$$

However, the estimation of model (3.1) often fails to meet reality due to the inability to account for the heterogeneous effects of time and space, as each space has its own distinct characteristics that may change over time. Therefore, shortcomings such as autocorrelation, changing variances, and multicollinearity are likely to occur in the Pooled OLS model.

On the other hand, the Fixed Effect Model (FEM) assumes that the intercept term is not fixed across space, meaning it varies across different countries but remains fixed over time. During analysis, many variables are omitted and replaced by

dummy variables to capture spatial-specific characteristics. The FEM is represented by the equation:

$$Y_{it} = \beta_i + \beta_1 X_{1it} + \beta_2 X_{2it} + \dots + \beta_n X_{nit} + u_{it} \quad (3.2)$$

Where the intercept term β_i is the average value of all intercepts across spatial units, and the error term u_{it} combines both spatial and time effects. However, this model may suffer from the "dummy variable trap," reducing degrees of freedom and risking multicollinearity due to the inclusion of many dummy variables. Another weakness of the FEM is the neglect of the effects of time-fixed components such as gender, race, and ethnicity.

Furthermore, in the Random Effect Model (REM), the slope coefficients are treated as random. These random coefficients are calculated as the sum of the expected value β_0 and the random error representing the spatial factor ε_i . The REM is represented by the equation:

$$Y_{it} = \beta_0 + \varepsilon_i + \beta_1 X_{1it} + \beta_2 X_{2it} + \dots + \beta_n X_{nit} + u_{it} \quad (3.3)$$

With $z_{it} = \varepsilon_i + u_{it}$ being the combined error term, we have the equivalent equation:

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \dots + \beta_n X_{nit} + z_{it} \quad (3.4)$$

4. RESULTS AND DISCUSSION

4.1 Descriptive statistics

4.1.1 Descriptive Statistics of Variables

Table 1 presents the descriptive statistics of variables in the research model before conducting regression analysis, including mean, standard deviation, minimum, and maximum values. The research sample of the author group comprises data from 48 Asian countries over a 20-year period (from 2000 to 2020). The number of observations ranges from 780 to 1056.

Table 1. Descriptive statistics of variables in the model

Variables	Observations	Median	Standard deviation	Minimum	Maximum
lnFDI	938	21.10167	2.284919	12.04355	26.39634
I	939	0.2759509	0.0918761	0.0558528	0.7033143
FD	966	0.3391925	0.2097627	0	0.92
FMD	945	0.275291	0.2741276	0	0.95
FID	966	0.2219462	0.23683	0	1
FIA	966	0.3098654	0.2395909	0	0.97
FIE	945	0.6132804	0.1197262	0	0.8
FMA	945	0.274836	0.2669087	0	1
FME	945	0.2954815	0.362549	0	1
DC	915	0.5613812	0.4754777	0.0126603	2.666084
CBB	781	0.1565861	0.1298857	0.0036662	0.7122988
DSA	963	26.58524	23.17684	-136.86	87.82679
INF	998	0.0569173	0.0866452	-0.1810863	1.547561
OPEN	949	97.33908	69.56338	11.8554	442.62
PG	1,056	1.752164	2.049606	-6.85212	19.36043
lnGDP	1,024	8.521893	1.400129	5.762073	11.50037
lnED	1,043	11.96001	2.876827	5.660946	19.03045
WTOD	1,056	0.7225379	0.4479586	0	1
YR	1,056	0.5909091	0.491899	0	1
INC	1,056	0.4630682	0.4988704	0	1

Source: Dang et al. (2023)

The research team transformed variables such as FDI, GDP, and ED into natural logarithms to normalize their distribution, facilitating the measurement of growth rates or percentage changes. Mean values for all 20 variables exceeded zero, with financial development indices averaging between 0.2 and 0.62. FDI, measured with the ln function, had an average value of 21.10167, while I, measured in percentage units, averaged 0.2759509. Variables like trade openness and total domestic savings displayed the highest standard deviations, indicating significant variations among Asian countries, with values of 69.56338 and 23.17684, respectively. Other variables showed narrower ranges between minimum and maximum values,

typically measured in percentage units.

4.1.2 Correlation Coefficient Matrix

When each variable in the model measures a characteristic of the dependent variable, and this characteristic is not included in any other independent variable, this model is supported as not violating the assumption of correlation between independent variables. Table 2 presents the detailed results of testing the correlation between the dependent variable and independent variables in the model. The results indicate a reasonable correlation between the dependent variable (lnFDI & I) and the main independent variable (FD), with correlation coefficients of 0.659 and -0.086, respectively, significant at the 1% and 5% levels. Hence, they can be used for further analysis without the likelihood of high multicollinearity.

Table 2. Correlation coefficient matrix between variables affecting foreign direct investment and domestic investment

Variables	lnFDI	I	FD	FMD	FID	FIA	FIE	FMA	FME	DC
lnFDI	1.000									
I	-0.009	1.000								
FD	0.659***	-0.086**	1.000							
FMD	0.588***	-0.080**	0.888***	1.000						
FID	0.582***	-0.120***	0.880***	0.784***	1.000					
FIA	0.330***	-0.089***	0.620***	0.322***	0.483***	1.000				
FIE	0.204***	0.105***	0.412***	0.315***	0.380***	0.183***	1.000			
FMA	0.522***	-0.100***	0.791***	0.739***	0.653***	0.379***	0.246***	1.000		
FME	0.563***	0.001	0.739***	0.645***	0.524***	0.238***	0.237***	0.426***	1.000	
DC	0.584***	-0.048	0.768***	0.636***	0.823***	0.532***	0.339***	0.582***	0.420***	1.000

Variables	CBB	DSA	INF	OPEN	PG	lnGDP	lnED	WTOD	YR	INC
CBB	0.122***	0.026	0.271***	0.040	0.173***	0.776***	0.125***	0.134***	-0.051	0.381***
DSA	0.363***	0.100***	0.391***	0.343***	0.204***	0.267***	0.374***	0.416***	0.223***	0.186***
INF	-0.117***	-0.019	-0.280***	-0.275***	-0.303***	-0.177***	-0.158***	-0.255***	-0.090***	-0.312***
OPEN	0.244***	-0.112***	0.375***	0.440***	0.538***	0.087***	0.064*	0.426***	0.031	0.434***
PG	-0.074**	0.004	0.040	0.149***	-0.109***	-0.050	0.074**	0.161***	0.011	-0.119***
lnGDP	0.457***	-0.145***	0.711***	0.592***	0.541***	0.631***	0.326***	0.698***	0.272***	0.540***
lnED	0.228***	0.079**	0.175***	0.009	0.112***	0.279***	0.206***	0.083**	0.137***	0.093***
WTOD	0.339***	-0.114***	0.458***	0.387***	0.369***	0.280***	0.184***	0.386***	0.326***	0.357***
YR	0.248***	0.126***	0.099***	0.102***	0.113***	0.239***	0.079**	0.028	-0.093***	0.183***
INC	0.085***	-0.037	0.087***	0.081**	-0.018	0.108***	0.003	0.212***	-0.051	-0.047

(***) significance level 1%, (**) significance level 5%, (*) significance level 10%

Source: Dang et al. (2023))

4.2 Testing hypothesis violations and model selection

4.2.1 Testing Assumptions Violations and Model Selection

4.2.1.1 Wooldridge Test

The research team conducted the Wooldridge test to examine the phenomenon of correlation between categorical independent variables and dependent variables in the panel data of the study. The results indicate that all four models have Prob.F test values of 0.0000, which are less than 5%, indicating the presence of self-correlation in the research model. The test results are summarized in Table 3.

Table 3. Summary of Self-correlation Test Results

Variables	lnFDI (Model 1)	lnFDI (Model 2)	I (Model 3)	I (Model 4)
F_value	F(17, 571) = 117.26	F(11, 611) = 143.48	F(17, 590) = 10.29	F(11, 622) = 8.05
Prob.chi2	0,0000	0,0000	0,0000	0,0000

Source: Dang et al. (2023)

Therefore, the study proceeded to apply robust standard errors to address the issue of varying error variances that may bias the estimated coefficients. The estimation results will be more appropriately measured with robust standard errors, and the presence of autocorrelation in the model is also accepted through this robust error model.

4.2.1.2 Variance Inflation Factor (VIF) Test

The research team used the Variance Inflation Factor (VIF) test to assess the multicollinearity of the model. Table 5.4 presents the test results:

Table 4. VIF Test Results

Variables	lnFDI (Model 1)	lnFDI (Model 2)	I (Model 3)	I (Model 4)
FD		4.83		4.75
FMD	7.42		7.7	
FID	8.56		8.56	
FIA	5.72		5.72	
FIE	1.53		1.53	
FMA	3.33		3.33	
FME	4.33		4.33	
DC	3.76		3.76	
CBB	4.38	1.62	4.38	1.6
DSA	2.1	1.46	2.1	1.45
INF	1.6	1.36	1.6	1.37
OPEN	3.01	1.95	3.01	1.9
PG	1.43	1.15	1.43	1.16
lnGDP	5.98	4.33	5.98	4.37
lnED	1.64	1.43	1.64	1.44
WTOD	1.37	1.32	1.37	1.32
YR	1.44	1.13	1.44	1.11
INC	1.55	1.22	1.55	1.22
Mean VIF	3.5	1.98	3.47	1.97

Source: Dang et al. (2023)

High correlation between independent variables is the first sign of multicollinearity. The larger the VIF value, the higher the multicollinearity. According to Henseler (2009), the threshold for this test is 10. The results of the VIF test show that the regression estimates are reliable as multicollinearity does not occur in all four estimated models, with VIF values for all four models falling below 10 - all lower than the common limit.

4.2.1.3 Modified Wald Test

The model's goodness of fit is relatively high, as indicated by the goodness of fit test result Prob = 0.0000. Additionally, the research team employed the Modified Wald test using the White test, with the command `imtest, white`, to examine the heteroskedasticity of the error variance for the estimation model. The test results are presented in the following table:

Table 5. Summary of Heteroskedasticity Test Results

Variables	lnFDI (Model 1)	lnFDI (Model 2)	I (Model 3)	I (Model 4)
chi2	chi2(167)= 329.55	chi2(74)=199.03	chi2(167)=389.02	chi2(74)=334.15

Prob>chi2	0,0000	0,0000	0,0000	0,0000
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Source: Dang et al.(2023)

The results indicate that the model exhibits heteroskedasticity. Therefore, the study utilized robust standard error models. This method provides accurate estimates of standard errors, and simultaneously, the presence of heteroskedasticity in the specified model is accepted.

4.2.1.4. Model Selection Test

The study aimed to analyse the influence of financial development on foreign direct investment (FDI) and domestic investment in Asian countries, utilizing the Ordinary Least Squares (OLS) method for panel data analysis. In Models 1 and 2, employing a logarithmic function for FDI revealed significant explanatory power, with lnFDI explaining 77.73% and 72.09% of variation, respectively. The F-values were 117.26 and 143.48, both statistically significant at 1%, indicating the model's validity. Notably, financial indices exhibited a negative correlation with FDI, while variables like trade openness, lnGDP, and commercial bank branches had a positive impact.

Similarly, Models 3 and 4 assessed the impact of financial development on domestic investment, showing explanatory power of 22.87% and 12.46%, respectively, with F-values of 10.29 and 8.05, statistically significant at 1%. Financial factors predominantly influenced domestic investment positively, alongside total domestic savings and per capita GDP. However, variables such as total trade openness, GDP, and WTOD had an inverse effect.

Recognizing the limitations of the Pooled OLS method in handling spatial and temporal variability, the authors incorporated Fixed Effects Model (FEM) and Random Effects Model (REM) for final model selection. The FEM model, chosen based on F-test results, depicted varying impacts of financial factors on capital flow into Asian economies, with higher income countries attracting less FDI. Conversely, the post-recession period witnessed a surge in FDI and domestic investment.

Additionally, the REM model, consistent with Pooled OLS and FEM, showcased an inverse relationship between financial indices and FDI. Subsequent tests, including the F-test and Hausman test, favoured the FEM model, highlighting its superiority over Pooled OLS. Meanwhile, the Hausman test validated the REM model's reliability.

Regarding FDI and domestic investment models, regression coefficients indicated significant negative impacts of variables FIA, FIE, and FME on FDI, with the general financial development index FD inversely related to FDI at a 1% significance level. Conversely, in the domestic investment model, FD and FME exhibited positive effects, while FIA had an inverse relationship. Overall, FD positively impacted domestic investment at a 1% significance level, underscoring the role of financial development in fostering domestic investment in Asian countries.

4.2.2. Regression Model Results

After testing Wooldridge and Modified Wald at the 5% level, the Feasible Generalized Least Squares (FGLS) estimation method shows that the model exhibits both autocorrelation and varying variance. At this point, FGLS - Feasible Generalized Least Squares is supported as an appropriate method for application to observations with the aim of overcoming these phenomena by increasing the confidence of parameter estimates in the model while determining and measuring the effects when using time-series data.

In the FGLS method, the Wald Chi2 test result indicates Prob > chi2 = 0.0000 in all four models, supporting that this study has addressed both issues and has a model suitable at a 5% significance level.

Table 6. Regression Results of FD's Impact on Foreign Direct Investment (FDI) and Domestic Investment

Variables	Model 1	Model 2	Model 3	Model 4
	lnFDI	lnFDI	I	I
FD: Financial Development		-0.307		3.380
		(0.524)		(3.832)
FMD: Financial Market Depth Index	3.722***		-3.774	
	(1.402)		(2.655)	
FID: Financial Institutional Depth Index	-0.0122		-1.993	
	(0.602)		(3.028)	

FIA: Financial Institutional Accessibility Index	0.334		-0.279	
	(0.502)		(3.017)	
FIE: Financial Institutional Efficient Index	-1.117**		3.950*	
	(0.474)		(2.247)	
FMA: Financial Market Accessibility Index	-0.468		2.976*	
	(0.334)		(1.700)	
FME: Financial Market Efficient Index	-0.282		0.285	
	(0.261)		(1.301)	
DC: Domestic Credit	0.585***		1.804*	
	(0.210)		(1.047)	
CBB: Commercial Bank Branches	0.193	0.358	-1.628	-2.277
	(0.887)	(0.604)	(5.273)	(3.715)
DSA: Total domestic savings	0.423	-0.0214	6.004**	6.422**
	(0.335)	(0.297)	(2.595)	(2.560)
INF: Inflation	0.549	0.387	10.68**	0.552
	(0.714)	(0.443)	(4.360)	(3.265)
OPEN: Opentradeness	0.822***	0.904***	-0.438	0.165
	(0.109)	(0.0861)	(0.568)	(0.531)
PG: Population Growth	0.593	-0.335	14.98	17.17
	(2.100)	(1.938)	(13.18)	(13.53)
lnGDP: Domestic Gross National Product	0.840***	0.807***	-0.0543	0.114
	(0.0562)	(0.0511)	(0.369)	(0.370)
lnED: GDP per capita	-0.0240	0.0104	0.697***	0.691***
	(0.0232)	(0.0221)	(0.166)	(0.171)
WTOD	0.453*	0.0975	-1.197	-0.316
	(0.237)	(0.159)	(1.258)	(1.285)
YR	0.337**	0.242	3.368***	2.507***
	(0.140)	(0.169)	(1.094)	(0.963)

INC	-0.448***	-0.406***	0.398	0.545
	(0.151)	(0.129)	(0.456)	(0.412)
Constant	-0.249	0.0333	15.89*	13.43
	(1.349)	(1.217)	(8.564)	(8.640)
Observants	589	623	608	634
Countries	41	41	41	41

Robust standard deviation values in parentheses

(***) significance level 1%, (**) significance level 5%, (*) significance level 10%

Source: Dang et al. (2023)

4.2.3. Regression Model Results Measuring the Impact of Financial Development on Foreign Direct Investment (FDI) and Domestic Investment in Asian Countries

The regression results of the model measuring the influence of financial development on foreign direct investment (FDI) and domestic investment are presented in Table 7. The table illustrates the varying degrees of impact on the dependent variable for each variable in each model:

Table 7. Regression Results of FD Impact on Foreign Direct Investment (FDI) and Domestic Investment (I)
(with interaction variables)

Variables	Model 1	Model 2	Model 3	Model 4
	lnFDI	lnFDI	I	I
int1	-3.948***			-4.800*
	(1.449)			(2.723)
int2	1.112***	1.133***		
	(0.272)	(0.232)		
int3			8.480**	7.055**
			(3.340)	(2.986)
int4	-0.744***	-1.046***	3.486*	2.128*
	(0.208)	(0.261)	(1.822)	(1.279)
int5		0.846*	-18.26***	-14.77***
		(0.507)	(4.957)	(3.994)
FD: Financial Development		-0.307		3.380
		(0.524)		(3.832)
FMD: Financial Market Depth Index	3.722***		-3.774	
	(1.402)		(2.655)	
FID: Financial Institutional Depth	-0.0122		-1.993	

	(0.602)		(3.028)	
FIA: Financial Institutional Accessibility Index	0.334		-0.279	
	(0.502)		(3.017)	
FIE: Financial Institutional Efficient Index	-1.117**		3.950*	
	(0.474)		(2.247)	
FMA: Financial Market Accessibility Index	-0.468		2.976*	
	(0.334)		(1.700)	
FME: Financial Market Efficient Index	-0.282		0.285	
	(0.261)		(1.301)	
DC: Domestic Credit	0.585***		1.804*	
	(0.210)		(1.047)	
CBB: Commercial Bank Branches	0.193	0.358	-1.628	-2.277
	(0.887)	(0.604)	(5.273)	(3.715)
DSA: Total domestic savings	0.423	-0.0214	6.004**	6.422**
	(0.335)	(0.297)	(2.595)	(2.560)
INF: Inflation	0.549	0.387	10.68**	0.552
	(0.714)	(0.443)	(4.360)	(3.265)
OPEN: Open tradeness	0.822***	0.904***	-0.438	0.165
	(0.109)	(0.0861)	(0.568)	(0.531)
PG: Population Growth	0.593	-0.335	14.98	17.17
	(2.100)	(1.938)	(13.18)	(13.53)
lnGDP: Domestic Gross National Product	0.840***	0.807***	-0.0543	0.114
	(0.0562)	(0.0511)	(0.369)	(0.370)
lnED: GDP per capita	-0.0240	0.0104	0.697***	0.691***
	(0.0232)	(0.0221)	(0.166)	(0.171)
WTOD	0.453*	0.0975	-1.197	-0.316
	(0.237)	(0.159)	(1.258)	(1.285)
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	(0.140)	(0.169)	(1.094)	(0.963)
INC	-0.448***	-0.406***	0.398	0.545
	(0.151)	(0.129)	(0.456)	(0.412)
Constant	-0.249	0.0333	15.89*	13.43
	(1.349)	(1.217)	(8.564)	(8.640)
Observants	589	623	608	634
Countries	41	41	41	41

Robust standard deviation values in parentheses

(***) significance level 1%, (**) significance level 5%, (*) significance level 10%

Source: Dang et al. (2023)

(1) Market Depth Index (FMD) and Financial Institution Efficiency Index (FIE) exhibit statistical significance in both FDI and domestic investment models. An increase in FMD contributes to higher FDI, while a rise in FIE leads to a decrease in FDI. However, FIE shows a positive correlation with domestic investment in one model, indicating its nuanced impact.

(2) Domestic credit to private sectors positively impacts both FDI and domestic investment, aligning with prior research highlighting the beneficial relationship between domestic credit resources and investment.

(3) Domestic savings positively affect domestic investment, reflecting the importance of encouraging higher domestic savings to foster diverse and prosperous domestic investment portfolios.

(4) The inflation index (INF) positively impacts domestic investment, contrary to the expected inverse effect on FDI. This suggests that higher inflation levels lead to increased domestic investment.

(5) Trade openness positively influences FDI, indicating that expanding international relations attract more foreign investment. However, it does not affect total domestic investment.

(6) Gross Domestic Product (GDP) positively correlates with FDI, implying that higher GDP creates an attractive environment for foreign investment. However, it does not affect domestic investment.

(7) Real GDP per capita (lnED) positively impacts domestic investment, consistent with prior research indicating that higher real GDP per capita leads to increased total domestic investment.

(8) Dummy variables, including WTOD (World Trade Organization accession), YR (post-economic recession period), and INC (high-income and upper-middle-income economies), provide insights into the impact of joining international organizations, economic recession periods, and income levels on investment flows.

The research findings are quite consistent with the theory of neoclassical and internal growth model. It gives the implications that the countries are open to trade will be more likely to have higher GDP per capita and get fast economic development (Nguyen et al., 2012). They are also in line with the research findings from Sache & Warner (1995), Edward (1998), Dollar & Kraay (2000). Furthermore, interaction variables between financial development indices and dummy variables reveal nuanced relationships, such as the impact of market depth index changes after joining the WTO on FDI and the influence of income levels on foreign investment scale.

Overall, the findings underscore the multifaceted nature of factors influencing investment flows in Asian countries and provide valuable insights for policymakers and investors seeking to understand and optimize investment strategies in the region.

5. CONCLUSION

5.1. Conclusion

Within the Asian region, the intricate interplay between financial development, foreign direct investment (FDI), and domestic investment has become increasingly apparent. The continuous evolution and volatility of financial markets have exerted significant influence on economic expansion, macroeconomic stability, and social welfare assurance. Our research delves into these dynamics, yielding several key insights. In the term of general aspect, FDI trends are multifaceted, requiring a nuanced analysis from macroeconomic and corporate strategic perspectives. We aim to elucidate these trends and assess the attractiveness of the Asian economy for FDI. Trade openness emerges as a crucial driver of investment, with liberalization policies bolstering international investment and fostering increased trade among nations. The alignment of trade policies with digital transformation initiatives further facilitates the flow of goods across borders, emphasizing the importance of comprehensive policies to promote trade and attract FDI.

In the regional landscape, the savings trend reflects the level of domestic investment in Asian countries, underscoring the bidirectional relationship between savings and investment. Domestic savings emerge as a pivotal factor influencing

domestic investment, signalling the importance of creating an environment conducive to savings accumulation. Legal innovations aimed at enhancing the financial quality of investment and prioritizing projects supporting technological development are identified as catalysts for economic growth. Overall, our research sheds light on the complex dynamics shaping FDI flows and underscores the significance of proactive policies to foster investment and economic development in the Asian region.

The research model has made positive contributions to individuals and entities, benefiting both specific individuals and organizations as a whole. Details are as follows:

- For the Government: Affirmation of the pivotal role of trade liberalization policies, expanding trade relations with countries in the same region as well as globally.
- For Businesses: Keeping abreast of and adapting to the situation to determine suitable directions for enterprises, ultimately ensuring profitability.

5.2. Recommendations

Firstly, Strategic planners in Asian economies must prioritize efforts to bolster trade activities, both regionally and globally, recognizing the significance of import-export dynamics with external nations. Policies should be geared towards supporting domestic businesses in expanding overseas markets while enhancing the quality of goods and services to meet evolving market demands. The influx of Foreign Direct Investment (FDI) in commerce places pressure on domestic retail entities, necessitating efforts to strengthen retail infrastructure and embrace the growing trend of digital commerce.

Secondly, E-commerce, particularly transactions on online platforms, has emerged as the mainstream trend in recent years, highlighting the need for timely adjustments to legal frameworks to regulate new business behaviours in the digital economy. Proactive initiatives to identify and remove trade barriers and resolve disputes are essential to protect economic interests and provide a stable foundation for foreign businesses. Effective implementation of key financial and monetary policies, along with business support and citizen assistance, is crucial for stability, recovery, and economic growth in a highly open economy susceptible to external fluctuations.

Thirdly, countries in the region must focus on continually enhancing national income to attract FDI by implementing measures to support employment and stabilize the labour market. Economic factors influencing income, such as market demand and purchasing power, play a significant role in shaping investment decisions and attracting foreign capital flows.

In conclusion, the recommendation emphasizes the importance of priority to trade activities, strengthening local enterprises, and embracing e-commerce in order to attract the stream line of investment in Asian economies. It also highlights the significance of improving savings policies, encouraging domestic investment, and fostering employment to consistently enhance national income and attract foreign capital inflows

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