Economic growth drivers and foreign direct investment in ASEAN-5 countries: Short-term and long-term impacts

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ABSTRACT

This study investigates the impact of foreign direct investment (FDI) on economic growth in five ASEAN countries: Vietnam, Thailand, Indonesia, Malaysia, and the Philippines, over the period 1990–2021. Using the Pooled Mean Group-Autoregressive Distributed Lag (PMG-ARDL) model, the research analyzes both long-run and short-run dynamics among key macroeconomic variables, including FDI, physical capital, labor, and trade openness. The empirical findings confirm a significant long-run relationship in which increases in all four variables positively contribute to economic growth. In the short run, only FDI, capital, and labor exhibit a statistically significant positive effect. Results from Granger causality tests indicate that GDP plays a central role in attracting FDI, promoting trade openness, and driving capital accumulation. The analysis also uncovers bidirectional causality between FDI and trade openness, as well as between capital and labor. These findings highlight the vital contribution of FDI to long-term economic development in ASEAN-5 countries, while also emphasizing the importance of maintaining balanced growth across complementary economic drivers. Policymakers are therefore advised to avoid overdependence on FDI inflows and instead adopt integrated strategies aimed at ensuring macroeconomic stability, enhancing domestic investment, and improving labor productivity. A coordinated policy framework that harmonizes efforts across FDI, trade, capital, and labor will be key to fostering sustained and inclusive growth in the region.

Contribution/ Originality: This study employs the PMG-ARDL model to investigate the short- and long-run impacts of foreign direct investment and factors of production on economic growth in five rapidly developing ASEAN economies, Indonesia, Malaysia, the Philippines, Thailand, and Vietnam, using panel data from 1990 to 2021 (including the post-COVID period). The findings provide a robust basis for evidence-based policymaking.

1. INTRODUCTION

In the contemporary era of continuous global transformations driven by globalization and high competition, foreign direct investment (FDI) has become crucial in shaping the economic development trajectories of nations (Al-Kasasbeh, Alzghoul, & Alghraibeh, 2022; Okere, Muoneke, Onuoha, & Omoke, 2022; Radmehr et al., 2022). The benefits of FDI for developing countries are well-documented and substantiated by both economic development theories and empirical research. FDI provides numerous opportunities for countries to integrate into the global market, fosters a more dynamic competitive environment, and promotes the growth of domestic enterprises. Empirical evidence has shown that many developing countries have successfully alleviated poverty through economic growth and significantly improved their social conditions through technology transfer facilitated by FDI (Chia, 1993;

Kawai & Naknoi, 2025; Miškinis & Byrka, 2014). The vital role of FDI is particularly evident in the economic development of the Association of Southeast Asian Nations (ASEAN), a region primarily comprising developing countries characterized by limited domestic savings, fiscal deficits, and inadequate infrastructure (Asia's Journey to Prosperity: Policy, 2025). These constraints lead to a lack of essential capital required to stimulate investment (ASEAN Investment Report, 2022). Consequently, in recent years, ASEAN countries have implemented a variety of flexible and permissive policies to enhance their capacity to attract investment for long-term sustainable growth. This is evident from the strong inflows of FDI that, by 2021, had raised the region's total FDI stock to $3.1 trillion, an impressive 72% increase from $1.8 trillion in 2015 (ASEAN Investment Report, 2022). The ASEAN-5 nations comprising Indonesia, Malaysia, the Philippines, Thailand, and Vietnam have received substantial FDI inflows across various sectors, resulting in a significant shift in their economic structures from heavy reliance on agriculture to a greater focus on production and export activities. However, most countries within the ASEAN community are still considered developing nations. Therefore, to overcome the "income trap" and transition to high-income status, these countries must maximize the role of FDI in driving economic growth.

The relationship between FDI and economic growth has been extensively studied, yet the results remain inconclusive across different economies. Numerous studies have examined this link in Asian countries, including several ASEAN nations, but their conclusions remain inconsistent. Notably, the ASEAN-5 group (Indonesia, Malaysia, the Philippines, Thailand, and Vietnam) has not received sufficient research attention, despite being among the fastest-growing economies and playing a key role in the region. This study addresses this research gap by providing a comprehensive analysis of the impact of FDI on economic growth in the ASEAN-5 countries, covering the period from 1990 to 2021, including data from the post-COVID-19 period. This broad time span allows for an examination of both pre- and post-globalization phases.

This study contributes to the academic literature in three main ways. First, it provides the latest empirical evidence on the relationship between FDI and economic growth in ASEAN-5, offering a long-term perspective that reflects significant regional changes, especially those driven by globalization and the post-COVID-19 period. Second, by applying the PMG-ARDL method, the study clearly differentiates between short- and long-term effects of FDI on economic growth, while incorporating the impacts of COVID-19, a factor that many previous studies have overlooked. Third, by utilizing Granger causality tests, the study expands upon traditional approaches, clarifying the dynamic relationships between FDI, trade, capital, and labor. These contributions provide valuable insights into the interdependent factors influencing FDI, offering a solid foundation for policymakers in the ASEAN-5 countries to design sustainable and balanced development strategies in the context of global integration.

2. LITERATURE REVIEW

Numerous studies have highlighted the importance of foreign direct investment (FDI) in fostering economic development. For instance, Basu and Guariglia analyze data from 119 developing countries and found that FDI contributes to both economic growth and inequality, while often reducing the share of agriculture in GDP (Basu & Guariglia, 2007). Tiwari and Mutascu also confirm the growth-enhancing effects of both FDI and exports in Asian economies during 1986–2008 (Tiwari & Mutascu, 2011).

Furthermore, spillover effects of FDI, such as technology transfer and human capital development, have been shown to improve labor productivity, especially in countries like Japan, South Korea, and China (Ahmed & Kialashaki, 2023). FDI also plays a key role in improving the business environment, infrastructure, employment opportunities, and economic security (Jibir & Abdu, 2017). However, the actual impact of FDI can vary significantly depending on national policies, institutional quality, and global economic conditions.

In the ASEAN-5 context, it was found that FDI positively influences job creation and income growth (Pham, Nguyen, & Phan, 2023; Ridzuan et al., 2018). Ahmad, Draz, and Yang (2018) observe a bidirectional long-term relationship between FDI and growth in the ASEAN-5, while in the short term, only a one-way causality from FDI

to exports was confirmed (Ahmad et al., 2018). These findings support both the export-led growth (ELG) hypothesis and the notion of growth-driven FDI.

On the other hand, some studies have questioned the unequivocal benefits of FDI. Desai, Foley, and Forbes argue that FDI's contribution to growth depends largely on the development of the local financial system (Desai, Foley, & Forbes, 2008). Additionally, while FDI tends to increase carbon emissions at lower economic levels, higher growth rates may offset such effects at upper quantiles, particularly in ASEAN-5 (Zhu, Duan, Guo, & Yu, 2016).

Moreover, the effectiveness of FDI is conditional upon the absorptive capacity of the host country (Borensztein, De Gregorio, & Lee, 1998) and over-reliance on exports may render economies vulnerable to external shocks (Liu, Shu, & Sinclair, 2009). Given these mixed findings, this study aims to contribute to the empirical literature by employing updated data and a methodology that addresses previous limitations to reassess the FDI–growth nexus in ASEAN-5.

2.1. Data

In this study, we utilize time series data on GDP, FDI, trade openness (TO), physical capital (K), and labor force (L) from 1990 to 2021. These data were sourced from the World Bank. Economic growth is defined as the increase in a country's production and services, measured by real GDP in 2015 US dollars.

Table 1. Descriptive statistics of variables in the period 1990-2021.

Variable	Mean	Std. dev.	Maximum	Minimum	Observation
LnGDP	26.1848	0.6679	24.5312	27.6946	160
FDI	3.0056	2.2436	-2.7574	11.9394	160
LnTO	4.3252	0.5473	3.0243	5.2486	160
LnK	24.6007	0.9017	22.0427	26.6582	160
LnL	17.4095	0.7545	15.7405	18.7296	160

Table 1 presents the descriptive statistics of the key variables used in the analysis, including foreign direct investment (FDI) as a percentage of GDP, trade openness (TO) as the export-import ratio, gross capital formation (K) in constant 2015 US dollars, and labor force (L) by number of workers.

3. METHODS

3.1. Econometric Methodology

This study analyzes the correlation between FDI, trade openness, and economic growth in five ASEAN countries. First, the efficient PMG-ARDL method is used to examine the existence of a long-term relationship between these variables. Next, the Granger causality test is applied to analyze the short-term correlation within the model.

An overview model of economic growth, trade openness, capital, labor, and foreign direct investment can be presented as follows:

$$Y_{it} = f(FDI_{it}, TO_{it}, K_{it}, L_{it}) \quad (1)$$

Where i=1,.....,N are the cross-section units observed over the periods t=1,......T; Y_{it} is the GDP output. The value of actual foreign direct investment inflows is denoted as FDI_{it}. Trade openness (TO_{it}) is represented by the ratio of exports and imports to GDP. Physical capital (K_{it}) is measured as gross capital formation (expressed in 2015 US dollars). The labor force, denoted as L_{it}, is measured by the labor force size.

To estimate model (1), we take the logarithm of both sides of Equation 1. The logarithmic equation of formula (1) is expressed as follows:

$$lnY_{it} = \propto + \beta_1 FDI_{it} + \beta_2 lnTO_{it} + \beta_3 lnK_{it} + \beta_4 lnL_{it} + \mu_{it} \quad (2)$$

In this study, the variables lnY, lnTO, lnK, and lnL denote the natural logarithms of economic growth, trade openness, capital, and labor force, respectively. All variables, except for FDI, due to its negative values, are

transformed into natural logarithms. This transformation serves two key purposes: (i) it helps reduce volatility, thereby enhancing the stability and reliability of ARDL estimations, and (ii) it allows the coefficients to be interpreted as elasticities, facilitating a more intuitive understanding of the magnitude of relationships among variables. Moreover, the logarithmic transformation tends to linearize nonlinear relationships, improving the model's overall interpretability.

The study covers the period from 1990 to 2021 to capture major structural and economic changes across ASEAN-5 countries (Indonesia, Malaysia, the Philippines, Thailand, and Vietnam). This timeframe encompasses critical events such as the pre- and post-globalization phases, the 1997 Asian Financial Crisis, increased regional economic integration, and the post-COVID-19 recovery. Given the dynamic economic evolution of these developing nations during this period, it provides an appropriate context for assessing the long-term impact of Foreign Direct Investment (FDI) on growth.

The choice of variables is grounded in classical and endogenous growth theories, which identify capital (K) and labor (L) as fundamental inputs for production, while positioning FDI as a key channel for technology diffusion and productivity enhancement (Borensztein et al., 1998). Trade openness is incorporated as a moderating factor, in line with empirical evidence (Balasubramanyam, Salisu, & Sapsford, 1996; Wong, Tan, & Goh, 2023), suggesting that FDI tends to exert a more pronounced effect on economic growth in countries with greater openness to international trade. These variables are also widely adopted in prior studies on emerging economies (Herzer, 2012; Mwakabungu & Wondimu, 2024) thus ensuring methodological robustness and comparability.

3.2. Cross-Sectional Dependence Test

Analyzing five ASEAN countries with shared characteristics and demographics, especially in terms of their assimilation into the economic growth process, suggests that interrelationships may exist across countries. These interrelationships could arise if similarities in these ASEAN economies are not taken into account, and the result of cross-sectional dependence leads to biased results. To avoid this possibility, the study employs a cross-sectional dependence test procedure proposed by Pesaran (2004). The null hypothesis is that there is no cross-sectional dependence, which means $H_0: \rho_{it} = \rho_{jt} = Corr(e_{it}, e_{it}) = 0 \ for \ i \neq j,$ against the alternative hypothesis of cross-sectional dependence, $H_1: Corr(e_{it}, e_{it}) \neq 0 \ for \ i \neq j$ where $e_{it} \ and \ e_{it}$ are the estimated residuals from the estimation of the aforementioned model.

3.3. Panel Unit Root Test

The next step before proceeding with any estimation is to test the stationarity of the variables using panel unit root tests with two objectives: avoiding spurious estimation due to non-stationary data and investigating the cointegration relationship. This study employs two unit root tests: the first-generation unit root test proposed by Im, Pesaran, and Shin (2003) (hereafter IPS) and the second-generation unit root test developed by Pesaran (2007). The IPS procedure addresses the limitation of assuming homogeneous autoregressive coefficients across cross-sections, which is present in earlier first-generation unit root tests. Moreover, Pesaran (2007) approach offers a significant advantage by limiting the issue of cross-sectional dependence in panel data (Pesaran, 2007).

3.4. Panel Cointegration Test

After confirming the stationarity of variables and determining the integration order, the study conducted a cointegration test to examine the long-run relationships among variables in panel data, allowing for both long-run and short-run dynamics with heterogeneity. Therefore, a panel cointegration test is required to provide more reliable and efficient results. The Pedroni and Kao approaches to panel cointegration are employed in this study due to their ability to address heterogeneous slope parameters and cross-sectional dependence in panel data (Kao, 1999; Pedroni, 2004).

3.5. PMG-ARDL

This study employed the Pooled Mean Group-ARDL approach proposed by Pesaran, Shin, and Smith (1999) to explore the relationship between FDI and economic growth in five ASEAN countries. The PMG-ARDL approach offers several advantages when applied to panel data. Firstly, by combining the strengths of both fixed effect and the mean group estimations, the PMG method allows for variations in short-run coefficients across countries while imposing homogeneity in long-run coefficients between them. In addition, the PMG-ARDL model has flexible integration capabilities, meaning it does not require the variables to have the same order of integration as previous methods. The order of integration of the variables can be I(0) or I(1). Lastly, the long-run estimators in the PMG-ARDL model are particularly useful for small sample sizes. This study experimentally analyzes the long-term relationships and short-term dynamic correlations between variables (economic growth, FDI, trade openness, physical capital, and labor force), considering the following PMG-ARDL in this study:

$$y_{it} = \lambda_i y_{i,t-1} + \sum_{j=0}^{1} \delta_{ij} X_{i,t-j} + \mu_i + \varepsilon_{it} \quad (3)$$

Where y represents the dependent variable, which is economic growth in this study, and X is the vector of independent variables, including FDI, TO, K, and L.

3.6. Panel Granger Causality Test

The Granger causal relationship between the variables is investigated in this study after establishing the long-term linkage between the variables through the cointegration test and assessing estimators using the PMG-ARDL model. The Granger causality test proposed by Dumitrescu and Hurlin (2012) is applied in this study.

The long-term conditional PMG-ARDL model can be represented as follows:

$$lnGDP_{it} = \alpha_{01} + \sum_{k=1}^{p} \alpha_{1i} lnGDP_{t-k} + \sum_{k=1}^{q} \alpha_{2i} FDI_{t-k} + \sum_{k=1}^{q} \alpha_{3i} lnTO_{t-k} + \sum_{k=1}^{q} \alpha_{4i} lnK_{t-k} + \sum_{k=1}^{q} \alpha_{4i} lnL_{t-k} + \varepsilon_{1t} \quad (4)$$

The final step is to estimate the error correction term (ECT) to study the short-term relationships within the context of the previously established long-term relationships.

$$d(lnGDP_{it}) = \alpha_{11} + \sum_{i=1}^{p} \alpha_{11i} d(lnGDP_{t-i}) + \sum_{i=1}^{q} \alpha_{21i} d(FDI_{t-i}) + \sum_{i=1}^{q} \alpha_{31i} d(lnTO_{t-i}) +$$
$$\sum_{i=1}^{q} \alpha_{41i} d(lnK_{t-i}) + \sum_{i=1}^{q} \alpha_{51i} d(lnL_{t-i}) + \alpha ECT_{t-1} + \varepsilon_t \quad (5)$$

Where d denotes the first difference operator, i represents the country, t indicates time, and ECT is the error correction term.

4. RESULTS AND DISCUSSION

The results of the cross-sectional dependence test are reported in Table 2. The null hypothesis of no cross-sectional dependence is rejected for most variables, except for the FDI variable.

Table 2. The result of the cross-sectional dependence test.

Variable	Pesaran CD
LnGDP	17.667***
FDI	-0.629
LnTO	9.877***
LnK	15.927***
LnL	17.489***

Note: ***, denotes statistical significance at the 1% level, respectively.

To conduct causality and long-term tests in panel data analysis, it is essential to test the stationarity of all variables using unit root tests. By applying both first- and second-generation unit root tests, Table 3 presents the results from the Im, Pesaran, and Shin test, as well as the CIPS test. The results indicate that FDI, LnK, and LnL are stationary at the level at 1%, 5%, and 1% significance levels, respectively. In contrast, the variables LnGDP and LnTO are non-stationary at the level but become stationary at the 1% significance level after first differencing. These results are consistent across both the IPS and CIPS tests. This has important implications for model specification, particularly

in the application of the PMG-ARDL model, as Pesaran argues that, under this assumption, the test statistics indicate that the variables can only be I(0) or I(1) (Pesaran, 2007).

Table 3. Panel unit root results.

Variable	IPS Im et al. (2003)		CIPS Pesaran (2007)		Decision
	Level	First difference	Level	First difference	
LnGDP	0.1727	-3.8222***	-2.077	-4.463***	I(1)
FDI	-3.1387***		-3.019***		I(0)
LnTO	0.0515	-6.4514***	-1.582	-4.766***	I(1)
LnK	-1.7371**		-2 .710***		I(0)
LnL	-2.9231***		-2.575**		I(0)

Note: ***, ** denote statistical significance at the 1%, 5% levels, respectively.

The results in present the panel cointegration using Pedroni (1999) and Kao (1999). The results support the rejection of the null hypothesis of no cointegration, indicating the presence of a long-run relationship among the variables.

Table 4. Results of Pedroni and Kao cointegration tests.

Statistic	Statistic (Value)	p-value
Pedroni cointegration test		
Phillips-Perron t	2.6607***	0.0039
Augmented Dickey Fuller t	3.3651***	0.0004
Kao test for cointegration		
ADF	-2.6926***	0.0035

Note: ***, denote statistical significance at the 1% level, respectively.

Table 5 presents the results of the panel data analysis using the PMG-ARDL approach, with a maximum lag length of 1 selected based on the Akaike Information Criterion (AIC). In the long run, all explanatory variables, including FDI, trade openness (TO), capital (K), and labor (L), positively influence economic growth. Capital and labor are significant at the 1% level, while trade openness and FDI are significant at the 1% and 10% levels, respectively. Specifically, a 1% increase in capital and labor corresponds to a 0.28% and 1.013% rise in GDP, respectively, while a 1% increase in trade openness raises GDP by 0.214%.%.

The findings confirm the FDI-led growth hypothesis, with a 1% increase in FDI contributing a 0.01% increase in GDP. This effect, though modest, underscores FDI's role in promoting long-term growth through capital injection, technology transfer, job creation, and market competition. These results align with Jibir and Abdu (2017) and Iamsiraroj (2016) but contrast with Klobodu and Adams (2016). The positive effect of capital formation is consistent with Belloumi (2014), who examined similar dynamics in the Tunisian economy from 1970 to 2008.

Table 5. Estimated the long-run and short-run coefficients using the ARDL approach.

Variables	Long run	Short run
ECT		-0.231*** (-9.86)
lnK	0.279*** (11.15)	0.0644*** (9.96)
lnL	1.013*** (11.42)	0.234*** (6.24)
D.lnTO		0.0243 (0.86)
D.FDI	0.0101* (1.651)	0.00233* (1.69)
lnTO	0.214*** (5.982)	
Constant		0.212 (0.84)

Note: *** and * denote statistical significance at the 1% and 10% levels, respectively.

K is gross capital formation, L is labor force, TO is trade openness, FDI is foreign direct investment, and D.FDI and D.lnTO represent the first differences of the variables FDI and lnTO, respectively. ECT (Error Correction Term) is a component in a regression model used to adjust for errors from a basic regression model. It is typically used in co-integration models to describe long-term adjustments from errors and ensure the stability of the model.

The error correction term (ECT) reflects the speed at which deviations from the long-run equilibrium are corrected. The coefficient of the lagged ECT is statistically significant at the 1% level and exhibits the expected negative sign, confirming the existence of a stable long-run relationship among the variables. This finding implies that short-term disturbances to the explanatory variables are gradually corrected over time, moving the system back toward its long-run equilibrium. With a coefficient of -0.231, the adjustment speed indicates that approximately 23.1% of any deviation from long-run economic growth is corrected within one year.

Regarding the short-run dynamics, the estimated coefficients suggest that only LnK (capital), LnL (labor), and FDI have a positive and statistically significant effect on economic growth, at the 1%, 1%, and 10% significance levels, respectively. This implies that in the short run, increases in capital formation, labor input, and foreign direct investment contribute to economic expansion.

Lastly, Table 6 presents country-specific estimates of the model. The presence of a significant long-run relationship is further supported at the individual country level, as shown by the negative and statistically significant ECT coefficients across all ASEAN-5 nations.

Table 6. Impact of factors on the economic growth of each country.

Variables	Vietnam	Thailand	Malaysia	Indonesia	Philippines
ECT	-0.0845***	-0.1799***	-0.2250***	-0.1022**	-0.2320***
	(-2.66)	(-4.86)	(-3.10)	(-2.02)	(-5.22)
D.lnK	0.1034***	0.1084***	0.0755***	0.1144***	0.0497***
	(3.32)	(6.19)	(2.91)	(5.45)	(1.97)
D.lnL	-0.1623	-0.4091	0.0573	0.0661	0.1898
	(-0.67)	(-1.22)	(0.09)	(0.22)	(0.98)
D.lnTO	-0.0219	-0.0675	0.0443	0.0196	0.057
	(-0.57)	(-1.15)	(0.57)	(0.66)	(1.01)
D.FDI	0.1238***	0.2673***	0.333***	0.1576**	0.3444***
	(2.62)	(4.89)	(3.09)	(2.11)	(5.24)
Constant	-0.0583	-0.0654	0.1378	-0.0761	-0.0951
	(-0.59)	(-0.35)	(0.67)	(-0.60)	(-0.40)

Note: *** , ** denote statistical significance at the 1%, 5% levels, respectively.

Regarding the magnitude of impact, the Philippines demonstrates the strongest error correction adjustment among the countries in the sample. This suggests that when the economy experiences shocks, it adjusts back to equilibrium more rapidly, as evidenced by the largest absolute value of the regression coefficient for the Error Correction Term (ECT). Additionally, capital (K) and FDI have a significant positive effect on economic growth in the sample countries at the 1% statistical significance level. In other words, increases in capital and FDI contribute to driving economic growth in these countries.

4.1. Panel Granger Causality Test

The Granger causality test confirms a unidirectional relationship from economic growth to FDI, consistent with Ahmad et al. (2018). Economic growth also causes increases in trade openness and physical capital, indicating that higher GDP levels contribute to improved international competitiveness and infrastructure. These developments, in turn, enhance the country's capacity to attract foreign investment, in line with Belloumi (2014). Among all variables, only labor demonstrates a statistically significant positive effect on economic growth. Additionally, trade openness is found to positively influence employment generation. The results presented in Table 7 indicate a bidirectional relationship between FDI and trade openness. Countries that adopt open trade policies, facilitating both imports and exports and fostering strong international integration, tend to attract more foreign investment. Meanwhile, an

increase in FDI brings foreign technology, managerial expertise, and access to international markets, which, in turn, boosts exports and imports, enhances productivity, and expands global trade links, further promoting trade openness. Additionally, a bidirectional relationship is observed between capital and trade openness, as well as between capital and labor, while no significant relationship is found between FDI and labor.

Table 7. Results of the Granger causality test.

Hypothesis	W-stat	Zbar-stat	Prob	Decision
FDI does not Granger-cause lnGDP	0.1337	-1.3698	0.1707	
lnGDP does not Granger-cause FDI	6.3072	4.8155	0.0000	GDP→FDI
lnTO does not Granger-cause lnGDP	0.6891	-0.4915	0.6231	
lnGDP does not Granger-cause lnTO	5.7821	4.2285	0.0000	GDP→TO
lnK does not Granger-cause lnGDP	0.6498	-0.5537	0.5798	
lnGDP does not Granger-cause lnK	6.4063	4.9264	0.0000	GDP→K
lnL does not Granger-cause lnGDP	6.0552	4.5338	0.0000	L→ GDP
lnGDP does not Granger-cause lnL	3.1664	1.3041	0.1922	
lnTO does not Granger-cause FDI	2.4949	2.3637	0.0181	$FDI \leftrightarrow lnTO$
FDI does not Granger-cause lnTO	2.4398	2.2765	0.0228	
lnK does not Granger-cause FDI	5.4231	3.8272	0.0001	lnK→FDI
FDI does not Granger-cause lnK	0.4498	-0.8699	0.3844	
lnL does not Granger-cause FDI	3.2882	1.4402	0.1498	No causality link
FDI does not Granger-cause lnL	2.9622	1.0758	0.2820	
lnK does not Granger-cause lnTO	6.6167	5.1616	0.0000	$lnK \leftrightarrow lnTO$
lnTO does not Granger-cause lnK	7.8193	6.5062	0.0000	
lnL does not Granger-cause lnTO	1.7394	1.1691	0.2424	
lnTO does not Granger-cause lnL	2.7436	2.7569	0.0058	lnTO→lnL
lnL does not Granger-cause lnK	5.7223	4.1616	0.0000	$lnK \leftrightarrow lnL$
lnK does not Granger-cause lnL	4.3014	2.5730	0.0101	

5. CONCLUSION AND RECOMMENDATIONS

This study investigates the impact of FDI on economic growth in five ASEAN countries over the period 1990–2021. The PMG-ARDL estimation confirms that capital, labor, FDI, and trade openness contribute positively to long-term economic growth, while in the short run, only capital, labor, and FDI are significant. Granger causality tests reveal that GDP drives FDI inflows, trade openness, and physical capital accumulation. Bidirectional relationships are found between FDI and trade openness, and between capital and labor.

These findings highlight the important, yet relatively modest, role of FDI in promoting economic growth compared to other domestic factors such as physical capital and labor. Therefore, ASEAN-5 countries should avoid excessive dependence on foreign capital and instead focus on strengthening internal growth drivers. Policy efforts should prioritize enhancing domestic capital formation, improving labor productivity, and expanding trade capacity. A balanced growth strategy that leverages both foreign and domestic resources is essential for achieving sustainable and resilient economic development.

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