Financial Development, Economic Freedom, and Economic Growth in Selected ASEAN Plus Three Countries: A Panel ARDL Model Analysis

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Abstract

This study examines the relationship between financial development and economic growth in ten selected member countries of the Association of Southeast Asian Nations Plus Three (ASEAN+3), namely China, Indonesia, Japan, Malaysia, Myanmar, the Philippines, Singapore, South Korea, Thailand, and Vietnam, over the period from 2000 to 2020. Brunei, Cambodia, and Laos are excluded from the analysis due to data limitations. Utilizing the panel Autoregressive Distributed Lag (ARDL) model, the empirical findings reveal that financial sector development exerts a significant positive impact on the long-run growth of per capita GDP. Additionally, economic freedom is recognized as a crucial determinant of short-run economic growth. The Dumitrescu-Hurlin panel causality test further reveals evidence of unidirectional causality, suggesting that economic freedom and financial development jointly influence the dynamics of economic growth across the sampled countries.

Keywords: Economic Freedom, Economic Growth, Financial Development, Panel ARDL.

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1. Introduction

The Association of Southeast Asian Nations (ASEAN) has emerged as a dynamic economic powerhouse in the Indo-Pacific region, with a combined GDP of approximately US$3.2 trillion, ranking as the third-largest economy in the region and the fifth-largest globally. Over the past decade, ASEAN has been the third-fastest-growing major economy, trailing only China and India, with annual growth consistently exceeding 5.5%. Projections indicate that by 2030, ASEAN is expected to surpass India and Japan to become the world's fourth-largest economy.

This rapid economic expansion has made ASEAN an increasingly attractive destination for global investment. In the context of shifting geopolitical and economic dynamics, particularly the Sino-U.S. trade tensions, multinational corporations have relocated production facilities to Southeast Asia to mitigate trade risks and leverage the region's comparative advantages. As these economies continue to develop, they present new opportunities for investment and heightened economic dynamism. Accordingly, a deeper understanding of the region's economic trends and the role of financial development in supporting growth is crucial for informing sound policy decisions.

As economies develop, the demand for financial services rises, prompting financial institutions to diversify their offerings and expand financial markets. This expansion not only creates additional investment opportunities but also enhances capital flows, thereby stimulating economic activity. A well-developed financial system improves capital allocation efficiency and provides crucial financing avenues for small and medium-sized enterprises. Moreover, greater stability and transparency in financial markets strengthen investor confidence, encouraging further investment and supporting consumption-driven growth.

Financial development broadly refers to the enhancement and expansion of a country's financial system, encompassing the establishment and deepening of financial markets, the growth of financial institutions, the innovation of financial products, and the reform of regulatory frameworks. The relationship between financial development and economic growth has been a long-standing subject of debate. Early contributions by Robinson (1952), Kuznets (1955), Goldsmith (1969), and McKinnon (1973) suggest that financial development has a positive influence on economic growth by providing more abundant funding, reducing capital costs, and enhancing the efficiency of resource allocation. In contrast, others, including Lucas (1988) and Chandavarkar (1992), caution that financial development may exacerbate resource misallocation and inequality.

This ongoing debate underscores the complex and multifaceted nature of the relationship between financial development and economic growth. While a substantial body of literature supports the view that a robust financial sector promotes economic efficiency and inclusiveness, some studies suggest a bidirectional or context-dependent relationship, wherein economic growth may also catalyze the development of the financial sector. Therefore, further empirical investigation is warranted to elucidate the underlying mechanisms and to inform policies that maximize the benefits of financial development while mitigating potential adverse effects.

The ASEAN Plus Three (APT) framework, comprising the ten ASEAN member states along with China, Japan, and South Korea, has played a pivotal role in advancing East Asian regional integration. Since its establishment, APT has served as a key institutional mechanism for fostering political, economic, and functional cooperation across the region. As of 2024, the combined nominal GDP of ASEAN stands at approximately USD 3.9 trillion, positioning it as the world's fifth-largest economy when considered as a single bloc. When China, Japan, and South Korea are included, the total economic output of the APT countries is estimated at USD 27.6 trillion, making APT the second-largest economic grouping globally in terms of nominal GDP. This figure exceeds that of the United States and is second only to the European Union.

This substantial economic footprint underscores the pivotal role of the APT framework in fostering regional integration and cooperation. The region serves as a manufacturing and export hub, as well as a growing center for investment, innovation, and consumption. Economic interdependence among APT countries continues to deepen through expanding trade volumes, increasing foreign direct investment, and coordinated regional initiatives aimed at fostering resilience and sustainable growth. As such, understanding the economic dynamics within this bloc is essential to interpreting broader shifts in the global economy. Therefore, this study focuses on examining the relationship between financial development and economic growth within the APT region.

This study aims to examine the relationship between financial development, economic freedom, and economic growth within the APT countries. Utilizing a panel Autoregressive Distributed Lag (ARDL), the analysis focuses on ten economies, including Indonesia, Malaysia, Singapore, the Philippines, Thailand, Vietnam, Myanmar, Mainland China, Japan, and South Korea, over the period from 2000 to 2020. The remainder of this paper is organized as follows: Section 2 provides a review of the relevant literature; Section 3 outlines the research methodology; Section 4 presents and discusses the empirical findings; and Section 5 concludes with key insights and policy implications.

2. Literature Review

The literature overwhelmingly supports a complex, context-dependent relationship between financial development and economic growth. While many studies confirm that a well-functioning financial system can enhance growth by improving credit access, fostering investment, and promoting trade, others highlight potential downsides such as instability or diminishing returns, particularly in more mature or resource-dependent economies. The causality is often bidirectional, with economic growth also driving financial development through increased demand for financial services, enhanced investor confidence, and improved institutional quality. Regional disparities, economic structure, and methodological approaches significantly shape these outcomes. Consequently, policymakers should adopt context-specific strategies that reflect their country's level of financial maturity, regulatory framework, and growth objectives.

2.1 Financial Development Leads to Economic Growth

The relationship between financial development and economic growth has long been a central focus of academic research. Early studies suggested that a well-developed financial system enhances the efficiency of resource allocation, thereby promoting economic growth (Levine, 1997). However, recent research highlights the complexity and regional variability of this relationship.

For example, Durusu-Ciftci et al. (2017) found that in a sample of 40 countries, the expansion of the credit market had a positive impact on per capita GDP, with the effect of the credit market outweighing that of the stock market. They emphasized the importance of deepening financial markets and strengthening creditor and investor rights to promote sustainable economic growth. Khobai and Mavikela (2017) reported a unidirectional causality from trade openness, foreign direct investment (FDI), and capital formation to economic growth in Argentina. Sharma and Bardhan (2017) demonstrated that in India, financial development promoted economic growth primarily through higher domestic savings rates.

Similarly, Ho and Iyke (2017) found that the banking sector played a critical role in driving economic growth in Hong Kong. In China, Chow et al. (2018) observed that financial development promoted growth in more advanced regions, while showing mixed causality elsewhere. Tadesse and Abafia (2019) found that financial development has a positive influence on both short-term and long-run economic growth in Ethiopia.

Osei and Kim (2020) found that in upper-middle-income countries, the positive effect of FDI on economic growth diminishes as the financial system matures. In contrast, Singh et al. (2023) demonstrated that in India, financial development and FDI have negative effects on economic growth in both the short and long term. Giri et al. (2023) found that economic growth had a unidirectional causality toward financial development, with negative growth adversely impacting financial development.

More recent studies provide further nuanced insights. Segovia and Cepeda (2024) found that increased banking credit to the non-financial private sector has a positive impact on per capita GDP growth in Mexico. Zhou et al. (2024) emphasized the role of financial development in influencing energy consumption, which in turn affects economic growth. Research in the Middle East and North Africa (MENA) region, conducted by El-Sayed and Hassan (2025), revealed a positive relationship between financial development, financial research output, and economic growth.

Institutional quality and financial system stability were also found to have a significant impact on economic performance (Kumar and Lee, 2025). In low-income countries, Nguyen et al. (2022) emphasized the crucial role of effective financial regulation and high-quality financial services in fostering economic growth. Chen et al. (2025) suggested that a robust financial system helps stabilize economic growth amidst high international capital flows. In Albania, Omar and Li (2025) found that financial development has a positive influence on economic growth, particularly under conditions of financial stability and strong institutional quality.

2.2 Economic Growth Leads to Financial Development

A growing body of literature examines the reverse causality, where economic growth is seen as a driver of financial development. Pan and Mishra (2018) used the ARDL model to find a long-run negative relationship between China's stock market and its real economy, particularly during the global financial crisis. However, economic growth spurred the development of secondary financial markets, such as the Shenzhen B-share.

Yang (2019), using a vector autoregression model (VAR) across 47 countries, discovered that in high-income nations, stock market development tends to follow economic growth rather than precede it. Nasreen et al. (2020) corroborated these findings in European countries using the generalized method of moments (GMM), showing that economic growth stimulates financial development by enhancing credit demand and investor confidence.

Turan and Abdiu (2024) studied the Western Balkans. They found that, while exports negatively impacted financial development in the long run, other growth-related sectors, such as tourism and transportation, played a positive role over time. Tian et al. (2024) observed a unidirectional relationship between economic growth and financial development in China, highlighting the importance of financial market depth and accessibility.

2.3 Mutual Causality: Financial Development and Economic Growth

Several studies adopt a more integrated view of this relationship. Shahbaz et al. (2013) analyzed data from China and identified bidirectional causalities among economic growth, financial development, trade, capital, and energy consumption. Similarly, Luintel et al. (2016) differentiated between income groups, suggesting that while high-income countries benefit more from market-based financial systems, low- and middle-income countries should first strengthen banking and securities institutions.

Burakov and Freidin (2017) revealed mutual causality between financial development and economic growth in Russia. Ouyang and Li (2018) found that the impact of financial development on economic growth in China varied by region, with some indicators even exerting adverse effects.

Ekanayake and Thaver (2021) applied Fully Modified Ordinary Least Squares (FMOLS) to data from 138 developing countries. They found bidirectional causality in South Asia, Europe, and Central Asia, but not in other regions. Nguyen et al. (2022) employed dynamic common correlated effects and Granger causality techniques to analyze emerging markets, confirming a bidirectional relationship between financial development and economic growth across various financial indicators.

3. Data and Methodology

3.1 Data

This study investigates the intricate relationship between financial development and economic growth across the selected ten ASEAN Plus Three countries over a two-decade period, spanning from

2000 to 2020. The variables include the economic growth rate (EG), Financial Development (FD), and economic freedom (EF). The economic growth rate serves as a crucial indicator of a nation's economic development. In contrast, the indicators of economic freedom encompass a myriad of dimensions related to liberalization, including financial and trade freedoms. This framework posits that increased economic liberalization substantially contributes to economic growth, whereby a higher degree of economic openness is associated with accelerated long-run growth.

We utilize economic growth rates as a vital indicator of economic progress, sourcing data from the World Bank. Accordingly, growth in GDP per capita is regarded as a critical indicator of economic progress.

Financial Development is measured by the Financial Development Index, which evaluates the evolution of a country's financial system by analyzing the depth, accessibility, and efficiency of its financial institutions and markets. Svirydzenka (2016) normalized this data on a scale from 0 to 1 and established nine unique indices, from which six fundamental sub-indices were crafted to assess the aforementioned dimensions of financial institutions and markets. These sub-indices were subsequently consolidated into two higher-level sub-indices that represent financial institutions and financial markets, and ultimately aggregated to form the Financial Development Index, which is drawn from the International Monetary Fund (IMF) database.

Economic freedom, on the other hand, evaluates the impact of economic policies on market operations. A high degree of economic freedom signifies limited government intervention, open markets, free trade, and strong protections for property rights. Gwartney et al. (2021) assess economic freedom across five categories: government size, legal structure, property rights protection, currency stability, and regulation related to free trade. They standardize and weigh the indicators within each category to derive scores, which are then averaged to compute an overarching economic freedom index that ranges from 0 to 10, with higher values indicating greater economic freedom. This index is derived from data provided by the World Bank.

3.2 Methodology

3.2.1 Panel Unit Root Tests

To investigate the relationship between economic development and financial development in ten ASEAN Plus Three Member Countries from 2000 to 2020, this study conducts a panel unit root test on variables to determine their orders of integration, specifically whether they are I(0), I(1), or a combination of both, provided that none of the variables are identified as I(2). The panel unit root tests employed herein include the Im, Pesaran, and Shin Test (IPS) (Im et al., 2003), the Fisher-ADF test (Maddala and Wu, 1999), and the Fisher-PP test (Choi, 2001).

The Levin, Lin, and Chu Test (LLC) (Levin et al., 2002) is specified as follows:

$$\Delta y_{i,t} = \alpha_i + \beta_i \cdot y_{i,t-1} + \gamma_i \cdot t + \sum_{j=1}^{k} \theta_{i,t} \cdot \Delta y_{i,t-j} + \varepsilon_{i,t} \quad (1)$$

where Δ denotes the first difference operator, $\varepsilon_{i,t}$ represents a white noise disturbance with a variance of σ^2, t =1, 2, …, T indicates time periods, and i=1, 2, …, N indexes the cross-sectional units. This model accommodates for two-way fixed effects (represented by parameters α and θ) and allows for unit-specific time trends. In the LLC test, the null hypothesis is specified as $\mathrm{H}_0 : \beta_i = 0$, for all i against the alternative $\mathrm{H}_1 : \beta_i = \beta < 0$, for all i.

The IPS test extends the framework established by LLC to account for variations in the test statistic under the alternative hypothesis, thereby relaxing the assumption of identical first-order autoregressive coefficients that characterizes the LLC test. This approach yields a panel-based unit root test, permitting β to vary across cross-sectional units under the alternative hypothesis. The null and alternative hypotheses for the IPS test are defined as follows::$\mathrm{H}_0 : \beta_i = 0$, for all i; $\mathrm{H}_\mathrm{A} : \beta_i < 0$ for some i. Empirical evidence presented by IPS suggests that their test demonstrates superior finite sample performance relative to that of the LLC test.

Furthermore, the Fisher-ADF test, as proposed by Maddala and Wu (1999), and the Fisher-PP test, developed by Choi (2001), presuppose an individual unit root process and calculate probabilities utilizing an asymptotic Chi-square distribution. A notable advantage of the Fisher tests lies in their flexibility; in contrast to the IPS test, they do not require a balanced panel. Additionally, the Fisher test accommodates varying lag lengths across individual ADF regressions and can be applied to any derived unit root test. However, a limitation of the Fisher test is the need to obtain p-values through Monte Carlo simulation techniques.

3.2.2 Dumitrescu-Hurlin Panel Causality Test

The Dumitrescu-Hurlin (DH) panel causality test (2012) is an advanced econometric method for investigating causal relationships in panel data settings. Compared to the traditional Granger causality test, the DH test offers several significant advantages. First, it corrects the critical values used in hypothesis testing, thereby enhancing the reliability and accuracy of the test outcomes. Second, the DH test accommodates heterogeneity by allowing for individual-specific causal relationships across cross-sectional units, making it more robust in the presence of cross-country differences.

Another key strength of the DH test is its flexibility in handling different panel dimensions. It remains valid in both large cross-sectional (N > T) and large time-series (T > N) panels, thus extending its applicability to a wide range of empirical contexts. This feature makes it particularly suitable for macroeconomic studies that involve countries with varying data availability across different time periods.

The DH test assesses Granger-type non-causality in heterogeneous panel data based on the following model:

$$y_{i,t} = \sum_{k=1}^{K} \beta_{i,k} y_{i,t-k} + \sum_{K=1}^{K} \gamma_{i,k} x_{i,t-k} + \epsilon_{i,t}, \quad (2)$$

for i = 1,…,N and t=1,…,T where $y_{i,t}$ and $x_{i,t}$ are two stationary variables for individual i at time t, and the coefficients $\beta_{i,k}$ and $\gamma_{i,k}$ are allowed to vary across individuals. The null hypothesis of the test states that there is no Granger causality from $x_{i,t}$ to $y_{i,t}$ for all panel units. In contrast, the alternative hypothesis allows for the presence of causality in at least a subset of the cross-sectional units.

This approach offers a more comprehensive framework for identifying and interpreting causal relationships in panel data, particularly in studies that span countries with diverse economic structures and varying development stages.

The coefficients $\beta_{i,k}$ are allowed to differ across individuals, reflecting heterogeneity in the causal relationships. However, they are assumed to be time-invariant for each individual unit. The lag order K is fixed and identical across all cross-sectional units, and the panel is assumed to be balanced. Similar to the Granger (1969) causality framework, the procedure determines whether past values of the explanatory variable x significantly affect the current values of the dependent variable y. The null hypothesis of non-causality is formulated as:

$$H_0: \gamma_{i,1} = \gamma_{i,2} = \cdots = \gamma_{i,K} = 0 \ \ \forall i = 1, \cdots, N \tag{3}$$

This implies that no Granger causality exists from x to y for any individual in the panel.

The alternative hypothesis allows for heterogeneity in the causal relationship, assuming that causality may be present for at least a subset of the cross-sectional units. It is expressed as:

$$H_0: \gamma_{i,1} = \gamma_{i,2} = \cdots = \gamma_{i,K} = 0 \text{ for } i = 1, \cdots, N$$

$$\gamma_{i,1} \neq 0 \text{ or } \cdots \text{ or } \gamma_{i,K} \neq 0 \text{ for } i = N_1 + 1, \cdots, N \tag{4}$$

where $N1 \ \epsilon$ [0, N −1] is unknown, this implies that for the first $N1$ individuals, no causal relationship exists, whereas for the remaining $N - N1$ individuals, a causal link from x to y is present. If $N1$=0, it implies that causality exists for all individuals in the panel. Conversely, if $N1$=N, the alternative hypothesis collapses to the null, indicating no causality for any individual.

This formulation enhances the flexibility of the DH test by allowing partial causality across the panel, which is more reflective of real-world heterogeneity in macroeconomic relationships across countries.

The DH panel causality test posits a null hypothesis asserting the absence of a causal relationship among the variables under examination. Conversely, the alternative hypothesis posits that a causal relationship exists in at least one cross-sectional unit within the panel data. To empirically evaluate the null hypothesis, researchers can employ either the Z-bar ($\overline{Z}$) statistic or the Wald statistic (W). The Z- statistic is particularly suited for scenarios where the time period (T) exceeds the sample size (N). In contrast, the Wald statistic is more appropriate when T is less than N.

$$\overline{W} = \frac{1}{N}\sum_{i=1}^{N} W_i \ , \ \bar{Z} = \sqrt{\frac{N}{2K}} \times (\overline{W} - K) \quad (5)$$

These calculations assume that the Wald statistics Wi are independently and identically distributed across the individual cross-sections. The number of lags (K) is determined based on an information criterion, such as the Akaike Information Criterion (AIC) or the Bayesian Information Criterion (BIC). As both T and N approach infinity (i.e., T →∞ and N →∞), the standardized statistic $\bar{Z}$ converges to a standard normal distribution. Should the Wald statistic exhibit statistical significance, it implies that a causal relationship exists for at least some of the cross-sectional units. Conversely, a significant Z-statistic would indicate the presence of a causal relationship across the entire panel data.

3.2.3 Panel Autoregressive Distributed Lag Model

The Panel Autoregressive Distributed Lag (ARDL) model offers a significant advantage over traditional panel data analysis methods in estimating both short-run and long-run relationships among variables. Unlike conventional approaches, the ARDL model does not require all variables to exhibit the same level of integration. This flexibility allows the model to accommodate variables with varying integration orders, making it especially valuable when some variables are integrated of order I(0), others of order I(1), or when a combination of both is present.

To estimate the panel ARDL model, we employed the Pooled Mean Group (PMG) estimator as proposed by Pesaran et al. (1999). This method facilitates the examination of both long-run and short-run equilibrium relationships among the variables, enabling researchers to detect potential co-integration without the need for additional co-integration tests. By leveraging the PMG estimator, the ARDL model provides a comprehensive framework for analyzing dynamic interactions among the variables across the panel.

In this study, we employed the ARDL integrated with an Error Correction Model (ECM) to explore both the long-run equilibrium and short-run dynamics between economic growth (EG), financial development (FD), and economic freedom (EF). The structure of our panel ARDL-ECM model can be outlined as follows:

$$\Delta EG_{i,t} = \sum_{k=1}^{p-1} \lambda_{ik} \Delta EG_{i,t-k} + \sum_{k=0}^{q_1-1} \delta_{1ik} \Delta FD_{i,t-k} + \sum_{k=0}^{q_2-1} \delta_{2ik} \Delta EF_{i,t-k} + \varphi_i ecm_{i,t-1} + \mu_i + \varepsilon_{i,t} \quad (6)$$

Where, $\Delta EG_{i,t}$ represents the change in economic growth for country i at time t. The terms $\Delta FD_{i,t}$, and $\Delta EF_{i,t}$ denote the changes in financial development and economic freedom, respectively. λ_{ik}, δ_{1ik}, and δ_{2ik}, are the coefficients that capture the short-run dynamics. φ_i represents the coefficient of adjustment for the error correction term, while μ_i accounts for individual country-specific effects, and $\varepsilon_{i,t}$ is the error term.

$$ecm_{i,t-1} = EG_{i,t-1} - \alpha_1 FD_{i,t-1} - \alpha_2 EF_{i,t-1} \quad (7)$$

Where, $ecm_{i,t-1}$ is the error correction term representing the deviation from the long-run equilibrium relationship.$EG_{i,t-1}$, $FD_{i,t-1}$, and $EF_{i,t-1}$ are the lagged values of economic growth, financial development, and economic freedom, respectively. α_1 and α_2 are the long-run coefficients associated with the explanatory variables. The optimal lag lengths, denoted as p and q, are re-determined based on the Schwarz Information Criterion (SIC), ensuring an appropriate fit of the model to the data.

4. Empirical Results

4.1 Results of Panel Unit Root Tests

Table 1 presents the results of the panel unit root tests conducted for the variables financial development (FD), economic freedom (EF), and economic growth (EG). For EG, we can reject the null hypothesis of a unit root at the 5% significance level, indicating that EG is stationary in levels, i.e., integrated of order zero, I(0). In contrast, the unit root tests for FD and EF in levels fail to reject the null hypothesis, indicating that these variables are non-stationary in their level forms. However, upon testing the first differences of these variables, the null hypothesis of a unit root is rejected, implying that the differenced series are stationary. Thus, FD and EF are integrated of order one, I(1).

Table 1. Panel Unit Root Test Results

Variable	Level 1st Diff.	IPS	Fisher-ADF	Fisher-PP	Oder of Integration
EG	Level	-0.08	34.95**	46.25***	*I*(0)
	1st Diff.	-7.69***	-----	-----	
FD	Level	3.05	15.73	16.23	*I*(1)
	1st Diff.	-8.66***	122.99***	240.12***	
EF	Level	-0.11	19.23	23.93	*I*(1)
	1st Diff.	-5.64***	75.13***	103.41***	

Note: *** and ** indicate significance at the 1% and 5% levels, respectively.

Overall, the Panel unit root test results reveal a mixed order of integration among the variables. EG is I(0), while FD and EF are I(1). None of the variables exhibits integration of order two, I(2). These findings justify the application of the ARDL-ECM framework, which accommodates variables with a combination of I(0) and I(1) integration orders.

This finding is critical as it underscores the necessity of differencing non-stationary variables before estimating the panel ARDL-ECM model, ensuring that the model can adequately capture both the short-run and long-run dynamics of the relationships between economic growth and its determinants. This model can significantly contribute to understanding the interplay between financial development and economic growth, thereby providing policymakers with valuable insights for enhancing economic performance.

4.2 Results of DH Panel Causality Tests

Table 2 reports the results of the Dumitrescu–Hurlin (DH) panel causality tests, revealing significant causal relationships between economic growth and its key explanatory variables.

A statistically significant relationship is identified between economic freedom and economic growth at the 5% significance level. This result enables the rejection of the null hypothesis of no causality, supporting the existence of a unidirectional causal relationship between economic freedom and economic growth. The findings suggest that improvements in economic freedom have a positive influence on economic growth within the panel framework.

The analysis of the causal relationship between financial development and economic growth indicates statistical significance at the 5% level. The null hypothesis is rejected once more, establishing a unidirectional causality from financial development to economic growth. This result aligns with prior empirical studies, including those by Sharma and Bardhan (2017), Giri et al. (2023), Segovia and Cepeda (2024), and Osei and Kim (2020), thereby corroborating the critical role of financial sector advancement in promoting economic expansion.

Table 2. Results of Dumitrescu Hurlin Panel Causality Tests

Null hypothesis	W-Stat.	Zbar-Stat.	Direction of Causality
FD does not cause EG	4.7602***	2.7797***	FD ⇒ EG
EF does not cause EG	4.2263**	2.1683**	EF ⇒ EG
EG does not cause FD	2.2387	-0.1084	EG ⇏FD
EG does not cause EF	3.0936	0.8708	EG ⇏EF

Note: *** and ** indicate significant at the 1% and 5% levels, respectively.

The results of the DH panel causality test, as summarized in Table 2, reveal important causal dynamics among the economic growth rate, financial development index, and economic freedom within the selected APT countries. Specifically, the findings indicate unidirectional causality running from financial development to economic growth and from economic freedom to economic growth. These results underscore the critical importance of designing and implementing effective, sustainable development policies tailored to the unique economic structures of the selected APT nations. The identified causal linkages provide empirical support for the influential roles of economic freedom and financial development, highlighting potential policy leverage points where targeted interventions may yield significant growth-enhancing effects.

4.3 Empirical Results of Panel ARDL-ECM Model

The optimal lag lengths are selected based on the Schwarz Information Criterion (SIC), resulting in the ARDL-ECM (p, q_1, q_2, q_3) specification. Table 3 presents the long-run and short-run estimation results derived from the PMG estimator, capturing the relationship between EG and the explanatory variables: FD and EF across selected APT countries.

As reported in Table 3, the coefficient of the error correction term is −0.80690 and is statistically significant at the 1% level. This negative and significant coefficient confirms the existence of a stable long-run equilibrium relationship among the variables. Moreover, it indicates that short-run deviations from the long-run equilibrium are corrected at an annual rate of approximately 80.7%.

In the long run, economic growth is positively associated with financial development. The long-run coefficient on FD is 4.22928, indicating that FD has a positive and statistically significant effect on EG. If the FD rises by 1%, the EG rises by approximately 4.23%. The long-run coefficient on EF is 0.19844, which indicates EF has a positive but nonsignificant effect on EG. If EF rises 1%, EG rises by around 0.20%, while the impact is nonsignificant.

Table 3. Results of Panel ARDL-ECM Model

Dependent variable $\Delta EG_{i,t}$		
	Long-run coefficients	
Variable	Coefficient	P-value
$EG_{i,t-1}$	0.00009***	0.0001
$FD_{i,t-1}$	4.22928**	0.0259
$EF_{i,t-1}$	0.19844	0.6476
	Short-run coefficients	
$ecm_{i,t-1}$	-0.80690***	0.0000
$\Delta EG_{i,t-1}$	0.004928***	0.0039
$\Delta FD_{i,t-1}$	2.183585	0.5278
$\Delta EF_{i,t-1}$	4.078556***	0.0007
constant	5.909643***	0.0001

Note: *** and ** indicate significance at the 1% and 5% levels, respectively.

In contrast, the short-run coefficient of FD is 2.183585, yet it is nonsignificant. This suggests that financial development does not exert a measurable impact on economic growth in the short run. One possible explanation is that financial reforms and initiatives often require time to be effectively implemented and translated into tangible economic outcomes. Short-run benefits may be limited due to adjustment lags, regulatory inertia, or initial inefficiencies in financial intermediation. The short-run coefficient on EF is 4.078556, which is positive and significant. This outcome suggests that an increase in economic freedom leads to increased economic growth in the short term. These changes may entail greater flexibility for corporate activities and reduced market barriers, which can temporarily boost economic growth. However, once these economic adjustments and the corporation adaptation period are complete, the economy will likely return to its long-run growth trajectory. At that point, the impact of economic freedom on economic growth may become negligible.

5. Conclusions

This study examines the dynamic relationship between financial development and economic growth in selected ASEAN Plus Three countries from 2000 to 2020, with a particular focus on the implications for long-run regional economic development. Due to limitations in data availability, the empirical analysis focuses on ten representative countries: China, Indonesia, Japan, Malaysia, Myanmar, the Philippines, Singapore, South Korea, Thailand, and Vietnam.

Empirical results from the Panel ARDL-ECM model reveal a time-dependent impact of financial development on economic growth. Specifically, financial development has a statistically significant and positive impact on long-run economic growth. In contrast, its short-run effect, although positive, is not statistically significant. This temporal divergence can be attributed to transitional frictions such as adjustment costs, delays in policy implementation, and the time required for institutional and financial reforms to yield tangible economic outcomes. When reforms are introduced, financial institutions, investors, and firms must adapt to new regulatory and market environments, which may delay the realization of economic benefits.

Additionally, short-run macroeconomic volatility and external shocks, such as fluctuations in global markets or shifts in investor sentiment, can diminish the observable short-term impact of financial development. These factors may temporarily overshadow the structural benefits that financial development is intended to provide.

In contrast, economic freedom demonstrates an opposite pattern. In the short run, economic freedom has a statistically significant and positive impact on economic growth. This finding highlights the responsiveness of economic agents to policies that promote market liberalization, reduce government intervention, and improve regulatory efficiency. By fostering a more open and predictable business environment, such policies encourage entrepreneurial activity, stimulate investment, and attract foreign capital. These dynamics contribute to immediate economic expansion through increased productivity, job creation, and competitive market behavior.

However, in the long run, the effect of economic freedom on growth remains positive but lacks statistical significance. While the direction of the relationship suggests that economic freedom continues to support growth, its marginal contribution over time appears to be limited. This implies that, in the long run, other structural variables, such as institutional quality, human capital accumulation, technological advancements, and international trade integration, may play a more decisive role in shaping economic performance.

Overall, the study highlights the asymmetric temporal effects of financial development and economic freedom on economic growth. Financial development serves as a key driver of long-run economic expansion, whereas economic freedom yields more immediate, short-run gains. These findings suggest the necessity of a balanced and coordinated policy approach that simultaneously promotes financial system development and economic liberalization. In the long run, policymakers

should prioritize the deepening of financial markets, enhancing financial infrastructure, and improving access to credit. In the short run, reforms aimed at deregulation, trade liberalization, and easing of market entry conditions can stimulate immediate economic activity.

A comprehensive policy framework that acknowledges and strategically integrates the distinct temporal effects of financial development and economic freedom will be better positioned to foster sustainable and inclusive growth across the ASEAN Plus Three region.

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