

# The Effect of Unemployment, Real Exchange Rates, Domestic Credit, and Foreign direct investment on Economic Growth in ASEAN-5

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## Abstract

This study investigates the effect of unemployment, real exchange rates, domestic credit, and foreign direct investment (FDI) on economic growth in five ASEAN countries Indonesia, Myanmar, Thailand, the Philippines, and Vietnam during the period 2000 to 2024. Using annual data from the World Bank's World Development Indicators (WDI), the study applies a Panel Autoregressive Distributed Lag (Panel ARDL) model under the Pooled Mean Group (PMG) estimator to analyze both long-run and short-run relationships among the variables. The findings reveal that, in the long run, the real exchange rate and domestic credit exert significant negative effects on economic growth, suggesting that excessive exchange rate volatility and inefficient credit allocation hinder economic performance. Conversely, unemployment and FDI show statistically insignificant effects, indicating that labor market inefficiencies and foreign investment inflows have not yet translated into consistent growth benefits across ASEAN economies. In the short run, the error correction term is negative and significant, confirming a strong adjustment toward equilibrium, while unemployment fluctuations have a substantial short-term impact on output. The results imply that exchange rate stability, efficient credit management, and improved labor market conditions are essential for sustaining long-term economic growth in ASEAN-5 countries.

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## Introduction

Economic growth in the ASEAN region has served as one of the main engines of stability for the broader Asian economy over the past two decades. Countries such as Indonesia, Myanmar, Thailand, Vietnam, and the Philippines have demonstrated strong performance despite global fluctuations, external shocks, and the impacts of the COVID-19 pandemic (Andabayeva, G. A., 2024). This consistent resilience highlights the region's adaptive economic structure and increasing integration within global value chains. However, the sustainability of this growth remains affected by structural challenges such as unemployment, exchange rate volatility, domestic credit imbalances, and dependence on foreign investment. These persistent issues continue to limit the full realization of inclusive and stable economic expansion. Therefore, understanding the interaction of these macroeconomic variables is essential for maintaining long-term regional stability.

In the context of long-term development, unemployment is a crucial indicator reflecting the efficiency of the labor market and a nation's productive capacity. High unemployment reduces aggregate demand and overall productivity, weakening economic

momentum. According to Andabayeva, G. A. (2024), a 1 percent increase in unemployment in Asian countries can decrease economic growth by approximately 0.3 percent. This empirical evidence supports Okun's Law, which establishes a negative relationship between unemployment and economic growth. Persistent unemployment can also increase income inequality and social vulnerability, further slowing economic progress. Therefore, improving labor market efficiency and job creation remains a priority for achieving sustainable growth.

The real exchange rate plays a vital role in determining export competitiveness and international trade flows. A stable real exchange rate enhances industrial performance through increased net exports, while excessive depreciation can trigger inflation and weaken household purchasing power (Lin, 2024). In the ASEAN-5 context, exchange rate volatility remains a challenge due to the region's high exposure to global capital movements and external demand shocks. Such instability can disrupt investment decisions and reduce trade efficiency across member countries. Policymakers must therefore balance monetary stability with export competitiveness to sustain long-term growth. Maintaining a managed and predictable exchange rate policy can also help mitigate speculative risks and currency mismatches.

The availability of domestic credit for the private sector significantly influences the pace and direction of economic growth. Broad access to credit can stimulate productive investment and entrepreneurial activities, accelerating industrial expansion. However, inefficient credit allocation or weak banking governance may increase financial risks and reduce capital productivity (Nguyen, 2024). In the ASEAN region, uneven credit distribution often leads to imbalances between financial growth and real economic performance. These imbalances can cause credit bubbles or resource misallocation, weakening economic stability in the long term. Thus, strengthening financial regulation and improving credit channel efficiency are critical to sustaining healthy economic growth.

Foreign direct investment (FDI) continues to serve as a major source of external capital that promotes structural transformation and economic expansion. FDI facilitates technology transfer, job creation, and industrial diversification, especially in developing ASEAN economies (Ramadhanty, 2024). However, the positive impact of FDI depends on the host country's absorptive capacity, infrastructure quality, and institutional strength. Inadequate governance or unstable macroeconomic conditions can reduce the effectiveness of FDI in supporting domestic productivity. Therefore, countries must create favorable business environments to attract and retain high-quality foreign investors. Strengthening local capabilities will ensure that FDI contributes sustainably to long-term economic growth.

The interaction among unemployment, real exchange rate, domestic credit, and FDI reveals an interdependent mechanism within the ASEAN macroeconomic system. Barguelli (2021) emphasized that fluctuations in external factors such as exchange rates can amplify or weaken the effect of FDI on growth depending on the domestic financial environment. This interdependence highlights the importance of analyzing macroeconomic variables jointly rather than in isolation. A comprehensive understanding of these relationships helps policymakers anticipate the spillover effects of shocks across sectors. It also supports more targeted interventions that align fiscal,

monetary, and financial policies. Hence, adopting an integrated analytical approach is crucial for achieving economic stability in both the short and long term.

Given the significance of these factors, empirical research examining the joint effects of all four variables in ASEAN remains limited. Most existing studies focus on individual determinants such as FDI or exchange rates without accounting for their combined influence or labor market dynamics (Pratomo, 2024). This narrow approach limits understanding of the region's broader macroeconomic interactions. A more holistic framework is needed to capture the simultaneous impact of financial, external, and labor market variables. Such analysis can reveal policy complementarities and trade-offs that conventional single-variable studies overlook. Therefore, this study seeks to fill this research gap within the ASEAN-5 context.

Dynamic analysis using the Panel ARDL approach is particularly suitable for exploring both long-run equilibrium relationships and short-run adjustments among macroeconomic variables. This method accommodates cross-country heterogeneity, enabling each country's specific dynamics to be captured accurately. It also allows for the estimation of long-term stability and short-term fluctuations within a unified model (Nguyen, 2024). Moreover, the ARDL framework can handle mixed orders of integration, making it ideal for ASEAN data structures. Using annual data from 2000 to 2024 provides a comprehensive temporal scope that includes pre-crisis, post-crisis, and recovery periods. This enhances the reliability of empirical findings and strengthens the study's policy relevance.

By identifying the directional influence of these variables, this study aims to provide new insights into how ASEAN-5 countries can optimize macroeconomic policy to promote sustainable growth. Reducing unemployment, maintaining exchange rate stability, improving credit efficiency, and enhancing FDI quality are viewed as strategic priorities (Ramadhanty, 2024). Coordinated policy design across these dimensions can improve resilience against global shocks. In addition, regional cooperation in financial and labor market reforms could further stabilize long-term growth patterns. Such policy coordination aligns with ASEAN's broader vision of inclusive and integrated economic development. Hence, this study's findings are expected to inform practical strategies for sustainable regional progress.

Ultimately, this research contributes both theoretically and practically to the understanding of macroeconomic growth determinants in Southeast Asia. Theoretically, it expands the literature by integrating labor, financial, and external sectors into a unified growth framework. Practically, it provides policymakers with evidence-based insights to design more adaptive and coordinated economic strategies. The results can guide fiscal, monetary, and investment policies to address structural vulnerabilities across ASEAN economies (Andabayeva, G. A. 2024). Furthermore, the findings highlight the need for stronger institutional capacity to sustain long-term economic resilience. Overall, this study enhances the empirical foundation for shaping future macroeconomic and development policies in the region.

## **Method**

The data used in this study consist of annual observations from 2000 to 2024 for five ASEAN countries, namely Indonesia, Myanmar, Thailand, the Philippines, and

Vietnam. All variables are obtained from the World Development Indicators (WDI) database published by the World Bank (2025), ensuring consistency and comparability across countries. The dependent variable is economic growth, measured as the annual percentage change in real Gross Domestic Product (GDP growth rate). The independent variables include the unemployment rate (UNEMP), which reflects the proportion of the labor force that is jobless; the real exchange rate (RER), which indicates a country's external competitiveness (2010 = 100); domestic credit to the private sector (DC), representing financial sector development and the availability of credit for investment; and foreign direct investment (FDI), measured as net inflows as a percentage of GDP, capturing external capital participation in the economy. All variables, except the unemployment rate and FDI, are transformed into their natural logarithmic forms to stabilize variance and mitigate heteroskedasticity. The selection of these variables follows previous empirical studies analyzing the determinants of economic growth in developing and emerging economies (Asteriou & Spanos, 2019; Rahman & Vu, 2023).

The empirical model follows a dynamic panel framework based on the Autoregressive Distributed Lag (ARDL) structure, which allows short-run dynamics and long-run relationships to coexist across the sample countries. The general model is expressed as:

$$\Delta \ln Y_{it} = \alpha_i + \sum_{j=1}^{p-1} \beta_{1ij} \Delta \ln Y_{i,t-j} + \sum_{j=0}^{q-1} \beta_{2ij} \Delta \ln X_{i,t-j} + \phi_i (\ln Y_{i,t-1} - \phi_i \ln X_{i,t-1}) \varepsilon_{it}$$

Where  $Y_{it}$  represents rice production per capita,  $X_{it}$  is a vector of explanatory variables,  $\phi_i$  denotes the error-correction term capturing the speed of adjustment toward equilibrium, and  $\varepsilon_{it}$  is the stochastic error term. A significant and negative  $\phi_i$  implies the existence of a stable long-run relationship.

This model is particularly appropriate because the variables are expected to be integrated of order  $I(0)$  or  $I(1)$  but not  $I(2)$ . The ARDL framework efficiently estimates parameters in small samples and addresses dynamic heterogeneity across countries, making it widely used in sustainability and agricultural production research (Nkoro & Uko, 2016; Ali et al., 2022). To estimate the long-run coefficients and short-run dynamics, the Pooled Mean Group (PMG) estimator by Pesaran, Shin, and Smith (1999) is applied. The PMG approach constrains long-run coefficients to be homogeneous across countries but allows short-run parameters, error variances, and adjustment speeds to differ.

## Result and Discussion

Before explaining the results of the ARDL Panel estimation, a series of analytical steps were first conducted, including stationarity testing, cointegration testing, and the

estimation of both short-run and long-run relationships. These steps ensure that the model satisfies the basic econometric assumptions and that the estimation results can be interpreted accurately and reliably.

The stationarity test is used to determine whether the data are stationary or not. The Augmented Dickey-Fuller (ADF) test ensures that each variable has the appropriate order of integration, either at level  $I(0)$  or at first difference  $I(1)$ . This step is crucial because the ARDL model can only be applied when the variables are not all integrated at the same order, but instead represent a combination of  $I(0)$  and  $I(1)$ .

Table 1. The Phillips-Perron tests for the variables in level and first difference

	individual intercept				individual intercept and tren				Kesimpulan
	At Level		First Difference		At Level		First Difference		
	t- statistic	p- value	t- statistic	p- value	t- statistic	p- value	t- statistic	p- value	
GDPG	48.1524	0.0000	435.164	0.0000	46.9564	0.0000	64.2899	0.0000	$I(0)$
UNEMP	9.86088	0.1384	88.4267	0.0000	8.43905	0.5860	105.519	0.0000	$I(1)$
RER	3.33581	0.9724	49.1105	0.0000	3.18278	0.9768	44.0310	0.0000	$I(1)$
DC	2.24190	0.9941	38.9289	0.0000	4.64662	0.9135	29.1999	0.0012	$I(1)$
FDI	45.2178	0.0000	191.669	0.0000	39.3051	0.0000	337.704	0.0000	$I(0)$

Source : Eviews 2025 output

The Phillips-Perron (PP) test shown in Table 1 is used to examine whether the data for each variable are stationary at level or after first differencing. The test results indicate that GDPG (economic growth) and FDI (foreign direct investment) are stationary at level, as reflected by their p-values below 0.05. Meanwhile, UNEMP (unemployment), RER (real exchange rate), and DC (domestic credit) are non-stationary at level but become stationary after first differencing, which means they are integrated of order one,  $I(1)$ .

These findings demonstrate that the dataset consists of a combination of  $I(0)$  and  $I(1)$  variables. Therefore, the ARDL model is appropriate for further estimation because it can handle variables with mixed integration orders, provided none are integrated of order two,  $I(2)$  (Phillips & Perron, 1988; Pesaran, Shin, & Smith, 2001).

After determining the order of integration, the next step is to test whether the variables have a long-run relationship. The cointegration test is conducted using the ADF approach on the model residuals. If the probability value is below 0.05, it indicates the existence of a long-term relationship among the variables in the study.

The cointegration test results shown in Table 2 indicate that there is a long-run equilibrium relationship among the variables. This test was conducted using both the within-dimension (Panel statistics) and between-dimension (Group statistics) approaches to confirm robustness. For the within-dimension results, the Panel PP-Statistic and Panel ADF-Statistic show significant values with probabilities of 0.0000 and 0.0047, respectively, which are below the 0.05 threshold. Similarly, the between-dimension results show that the Group PP-Statistic and Group ADF-Statistic also have probabilities

of 0.0000 and 0.0002. These findings indicate that the null hypothesis of no cointegration can be rejected, suggesting that GDPG, UNEMP, RER, DC, and FDI share a stable long-run relationship.

This result implies that despite short-term fluctuations, the variables tend to move together over time and return to long-run equilibrium. Therefore, the presence of cointegration supports the use of the ARDL Panel model to analyze both short-run and long-run dynamics among these macroeconomic variables (Pedroni, 1999; Pedroni, 2004; Pesaran, Shin, & Smith, 2001).

Table 2. Cointegration Test

Alternatif hypothesis: common AR coefs. (within-dimension)				
	Statistic	Prob.	Weighted Statistic	Prob.
Panel v-statistic	-0.263390	0.6039	-1.512684	0.9348
panel rho-statistic	-0.567838	0.2851	-0.945443	0.1722
panel PP-statistic	-4.440039	0.0000	-5.523624	0.0000
Panel ADF-statistic	-2.595036	0.0047	-3.115860	0.0009
Alternatif hypothesis: individual AR coefs. (between-dimension)				
	Statistic	Prob.		
Group rho-Statistic	-0.074908	0.4701		
Group PP-Statistic	-6.126483	0.0000		
Group ADF-Statistic	-3.521896	0.0002		

Source : Eviews 2025 output

After confirming the presence of cointegration among the variables, the next stage is the estimation of both long-run and short-run relationships using the ARDL Panel model. This stage estimates the dynamic interactions between the dependent and independent variables. The long-run coefficients indicate the direction and magnitude of the effects in a stable period, while the short-run coefficients describe the dynamic adjustment process through the value of the Error Correction Term (COINTEQ).

The Panel ARDL estimation results reveal both long-run and short-run relationships between macroeconomic factors and economic growth in five ASEAN countries. In the long run, the unemployment rate (UNEMP) has a negative but insignificant effect on economic growth, with a coefficient of -0.263324 and a probability value of 0.1157. This indicates that although higher unemployment tends to reduce growth, the effect is not statistically significant. The real exchange rate (RER) has a negative and highly significant effect, with a coefficient of -0.000212 and a probability of 0.0000, showing that currency depreciation weakens economic performance through higher import costs and reduced trade competitiveness.

Domestic credit to the private sector (DC) also shows a negative and significant relationship, with a coefficient of -0.020107 and a probability value of 0.0064. This suggests that excessive or inefficient credit allocation may hinder productive investment and long-term growth. Conversely, foreign direct investment (FDI) has a positive but

insignificant effect, with a coefficient of 0.039892 and a probability value of 0.7702, implying that FDI inflows have not yet translated into substantial growth benefits across these countries. The constant term (C) is positive and highly significant, suggesting the presence of stable underlying growth momentum when other variables are controlled.

Table 3. ARDL Panel Test Result

Variabel	Coefficient	Std.Error	t-Statistic	Prob.
Log-run Pooled) Coefficients				
UNEMP	-2.263.324	0.166057	-1.585.743	0.1157
RER	-0.000212	2.92E-05	-7.248.856	0.0000
DC	-0.020207	0.007227	-2.782.060	0.0064
FDI	0.039892	0.136204	0.292887	0.7702
C	9.341.392	1.222.951	7.638.400	0.0000
Short-run(Mean-Group) Coefficient				
COINTEQ	-0.811897	0.176785	-4.592.560	0.0000
D(GDPG(-1))	-0.078729	0.124575	-0.631979	0.5287
D(UNEMP)	-2.839.334	1.233.421	-2.301.998	0.0232
D(DC)	-0.355861	0.198142	PI.795988	0.0752

Source : Eviews 2025 output

In the short run, the coefficient of the error correction term (COINTEQ) is -0.811897 and statistically significant at the 1 percent level, confirming a strong adjustment toward long-run equilibrium, where about 81 percent of disequilibrium is corrected annually. The short-run changes in unemployment (D(UNEMP)) have a negative and significant impact on growth, with a coefficient of -2.839334 and a probability of 0.0232, indicating that fluctuations in employment strongly influence short-term economic performance. Meanwhile, domestic credit (D(DC)) has a negative but weakly significant effect, with a probability of 0.0752, showing limited short-run influence. Overall, the results highlight that exchange rate stability and credit efficiency are key drivers of sustainable economic growth in ASEAN countries, while unemployment remains a critical short-term determinant of output performance.

### Policy and Implication

These findings are consistent with several previous studies that examined the macroeconomic determinants of growth in developing and ASEAN economies. Similar results were reported by Barguelli (2021), who found that excessive exchange rate volatility undermines long-term economic performance by reducing trade competitiveness and discouraging FDI inflows in developing countries. Likewise, Nguyen (2024) confirmed that rapid domestic credit expansion without proportional improvements in financial efficiency can negatively impact growth across ASEAN nations. In addition, Pratomo (2024) highlighted that persistent unemployment and weak investment absorption remain key barriers to sustainable growth in Southeast Asia, supporting this study's finding that labor market inefficiencies reduce short-run output stability. Andabayeva, G. A. (2024) also emphasized that post-pandemic growth sustainability in Asia depends on employment-oriented strategies and stronger labor market recovery mechanisms.

Furthermore, Lin (2024) showed that real exchange rate instability erodes export competitiveness, while Ramadhanty (2024) concluded that FDI contributes to growth only when host countries possess strong institutional capacity and innovation-driven sectors. These collective findings reinforce the conclusion that ASEAN-5 economies must pursue balanced macroeconomic management combining exchange rate stability, prudent credit policies, and productive investment utilization to ensure inclusive and sustainable growth.

**Conflict Interest:** The authors declare no conflict of interest.

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