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ASEAN Economic Growth: The Influence of Inflation, Trade, and Industrial Policy

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ABSTRACT

This study aims to analyze the factors that affect economic growth in ASEAN countries, namely Singapore, Indonesia, Malaysia, Thailand, and the Philippines, during the period 1986-2022 using data from the World Development Indicators (WDI). The regression method is used to identify the impact of variables such as inflation, exchange rate, industrial value added (IVA), labor, interest rates, tax revenues, trade value, population, and investment on economic growth. The results of the study show that industrial value added (IVA), tax revenue (Tax_rev), and trade value (TRADE) have a significant influence on the economic growth of ASEAN countries. On the other hand, inflation has a negative effect on economic growth in Singapore, Malaysia, and the Philippines. In addition, the workforce has a positive influence on economic growth in Indonesia, Singapore, and Malaysia. These findings provide important insights for policymakers in ASEAN to pay attention to structural factors such as industrial policies, taxation, and trade in supporting sustainable economic growth. This study not only analyzes the data statistically, but also directly links it to policy implications, particularly on three important aspects: industrial, taxation, and trade policies. This approach provides a real applicative contribution to the formulation of sustainable development policies in ASEAN.

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INTRODUCTION

Economic growth is one of the main indicators in assessing the success of a country's development. In the Southeast Asian region, ASEAN member countries have a strategic role in encouraging regional economic stability and development. However, the dynamics of economic growth in these countries are influenced by a variety of complex and interrelated macroeconomic factors, such as inflation, exchange rates, industrial value-added, labor, interest rates, tax revenues, trade, population, and investment. This study focuses on five ASEAN countries, namely Indonesia, Singapore, Malaysia, Thailand, and the Philippines during the period 1986–2022, with the aim of analyzing the influence of these various variables on economic growth. Using data from the World Development Indicators (WDI) and the panel regression method, this study seeks to provide an in-depth empirical understanding of the main factors that drive or hinder economic growth in the ASEAN region. The results of this analysis are expected to be the basis for formulating more targeted and sustainable economic policies at the national and regional levels.

Economic growth is the main indicator in assessing the success of a country's development. In the ASEAN region, economic growth is an important focus in the economic policies of every member country, given its significant contribution to people's well-being and regional economic stability. ASEAN countries consisting of Singapore, Indonesia, Malaysia, Thailand, and the Philippines have diverse economic characteristics, but they share the same challenges in managing growth-driving factors such as inflation, trade, exchange rates, labor, and industrial policies (Todaro & Smith, 2009 and Mankiw & Taylor, 2020).

Research on the factors affecting economic growth in developing countries has been extensive, but studies specializing in the ASEAN region are still limited. Several previous studies have shown that variables such as industrial value-added (IVA), investment, and trade have a significant influence on economic growth (Were, 2015). In addition, inflation is often considered a factor that can depress economic growth, although the impact varies between countries (Khan & Naushad, 2020).

As one of the regions with dynamic economic growth, a better understanding of the factors affecting economic growth in ASEAN is essential. Therefore, this study aims to analyse the influence of inflation, exchange rates, industrial value added (IVA), labor, interest rates, tax revenues, trade value, population, and investment on economic growth in ASEAN countries, using panel data from 1986 to 2022. The findings of this study are expected to provide deeper insights that are useful for economic policy making at the national and regional levels.

The purpose of this study is to analyse the factors that affect economic growth in five ASEAN countries, namely Singapore, Indonesia, Malaysia, Thailand, and the Philippines, using secondary data obtained from the World Development Indicators (WDI). This study aims to identify the influence of inflation, exchange rate, industrial value added (IVA), labor, interest rates, tax revenue, trade value, and investment on economic growth. In addition, this study also aims to understand the differences in the influence of these economic factors in each country, as well as provide relevant policy recommendations to encourage sustainable economic growth in ASEAN countries.

This research has several novelties compared to previous studies. Most previous studies of economic growth in ASEAN tend to be limited to a single country analysis or use a short time span, so they have not been able to capture long-term dynamics comprehensively. This study presents a more comprehensive approach by combining cross-country analysis (Indonesia, Singapore, Malaysia, Thailand, and the Philippines) over a long period, namely 1986–2022. In addition, the variables used in this study include various important macroeconomic indicators such as industrial added value, tax revenue, trade value, inflation, and labor simultaneously. The findings of this study also show that there are differences in influence between countries, thus highlighting the importance of a policy approach that is tailored to the specific conditions of each country. It makes a new contribution to the regional economic literature by emphasizing the importance of heterogeneity analysis in economic development policymaking in ASEAN.

LITERATUR REVIEW

Economic growth is often understood as an increase in national output generated by factors of production, such as labor, capital, and technology. According to classical economic growth theory (Solow, 1956), economic growth is caused by the accumulation of capital and labor, as well as technological advancements. However, more factors can affect economic growth, including fiscal policy, inflation, and international trade. In the context of ASEAN countries, we see the interaction between several variables that can affect the rate of economic growth.

Inflation is an increase in the price of goods and services in the economy. De Koning (2022) argued that high inflation can reduce people's purchasing power and create economic uncertainty, which ultimately hinders investment and economic growth. Regression results in several ASEAN countries show that inflation has a negative influence on economic growth, especially in Singapore, Malaysia, and the Philippines. Previous research such as the one conducted by Akinsola & Odhiambo (2017) and Ekinci, et al (2020) shows that inflation affects economic growth in different ways depending on the inflation rate and economic conditions of a country. However, the study examines developed countries more, while developing countries such as ASEAN may experience a greater impact from high inflation, especially in the context of price stability and global competitiveness.

Investment is considered a driving force for economic growth, as it increases production capacity through the addition of physical capital. According to Herzer (2011) and De Ridder (2016), productive investment can increase national output in the long run. On the contrary, Litvinenko, et al (2016) and Giang, et al (2018) show that good investment quality and investment climate will contribute to job creation and industrial development. Investment has a positive influence on economic growth in

Indonesia and other countries, which is in accordance with the theory of economic growth which states that capital accumulation increases productivity and output (Valente, 2016). Empirical studies conducted by Nguyen (2022) show that foreign direct investment (FDI) plays a key role in increasing economic growth in developing countries, including ASEAN countries.

Exchange rates affect a country's international competitiveness. Genc & Artar (2014) and Nguyen & Do (2020) explain that changes in exchange rates can affect exports and imports, which in turn affects the domestic economy. Although the influence of exchange rates on economic growth is not significant in all ASEAN countries in this analysis, some countries, such as Thailand, show that exchange rates can play a role in increasing international trade and economic growth. Bostan, et al (2018) and Kang & Dagli (2018) stated that exchange rates can affect the competitiveness of international trade, but the results of this study show inconsistencies in the effect of exchange rates on economic growth in several ASEAN countries.

According to Mehrara & Baghbanpour (2016) and Karadağ (2016), industry has an important role in economic growth because industry is a sector that can generate added value and increase productivity. In this analysis, industrial added value was shown to have a positive influence on economic growth in almost all countries analysed, demonstrating the importance of the industrial sector as a key driver.

International trade opens opportunities for greater exports and imports, which can drive economic growth. Erkisi & Ceyhan (2019) and Nteegah, et al (2017) stated that trade liberalization has a significant influence on economic growth, especially in countries that are integrated in the global economy.

Based on previous research, the following hypotheses can be drawn:

H1 : Inflation (INF) has a negative and significant influence on economic growth in Indonesia, Singapore, and the Philippines.

H2 : Investment (LOG(INV)) has a positive and significant effect on economic growth in Indonesia and Singapore but has a negative and significant effect in Malaysia and the Philippines.

H3 : The exchange rate (LOG(ER)) has a positive and significant effect on economic growth in Thailand.

H4 : Industrial value added (LOG(IVA)) has a positive and significant effect on economic growth in all ASEAN countries observed, namely Indonesia, Singapore, Thailand, and the Philippines.

H5 : The domestic interest rate (LIR) has no significant influence on economic growth in the countries observed.

H6 : The global interest rate (LOG(LIBOR)) has a positive and significant impact on economic growth in Indonesia and Singapore but has a significant negative effect on Malaysia.

H7 : Population (LOG(POP)) has a positive and significant effect on economic growth in Indonesia and Malaysia but has a negative effect on Thailand.

H8 : Tax revenues (LOG(TAX_REV)) have a positive and significant effect on economic growth in Singapore, Malaysia, and Thailand, but are significant negative in Indonesia.

H9 : The value of trade (LOG(TRADE)) has a positive and significant effect on economic growth in Indonesia, Singapore, Malaysia, and the Philippines, but has a significant negative effect on Thailand.

RESEARCH MEHODOLOGY

Multiple regression is a statistical method used to analyse the relationship between one dependent variable and more than one independent variable (Basuki and Prawoto, 2019). Here are the steps in building multiple regression equations by hypothesis testing:

The multiple regression model can generally be expressed as follows:

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \cdots + \beta_k X_{ki} + \epsilon_i$$

Where:

Y_i	is a dependent variable (in this case, economic growth).
$X_{1i}, X_{2i} \ldots, X_{ki}$	are independent variables (e.g., inflation (INF), investment (INV), exchange rate (ER), industrial value added (IVA), etc.).
β_0	is a constant or intercept.

$\beta_1, \beta_2 \ldots, \beta_k$ is a regression coefficient that describes the relationship between independent and dependent variables.

ϵ_i is a term error that indicates a variation that the model does not describe.

After testing each coefficient, the next step is to test whether the regression model is significant. After testing the coefficients and models, it is necessary to examine the classical assumptions (Wooldridge, 2016; Gujarati, 2021) in multiple regression, namely: Heteroscedasticity: Non-constant error variance. This test can be performed with the Breusch-Pagan test, Autocorrelation: The correlation between errors in different periods. The Durbin-Watson test is used to detect this problem, and Multicollinearity: Occurs when there is a high correlation between independent variables. This test can be done by calculating VIF (Variance Inflation Factor).

RESULTS AND ANALYSIS

The following is an analysis of multiple regression results for Indonesia, Singapore, Malaysia, Thailand and the Philippines with statistical tests and econometric tests based on the following outputs.

Table 1. Multiple Regression Results and Classical Assumption Tests

Variable	Indonesia	Singapore	Malaysia	Thailand	Philipines
INF		-0.0076	-0.0150	-0.0023	-0.0062
		-2.3803***	-2.5787***	-1.1237	-1.9852*
LOG(INV)	0.3552		0.2021	-0.1537	-0.0646
	6.1183***		2.4839**	-2.7022***	-1.7247*
LOG(ER)	0.0369	0.0840	0.1427	0.2232	
	1.2321	1.1656	1.1201	3.3225***	
LOG(IVA)	0.3135	0.4128	0.0931	1.2182	0.4207
	3.5111***	3.2478***	0.6190	10.1643***	4.4900***
LIR	-0.1138		0.0064	-0.0045	
	-0.3281		0.8274	-1.4678	
LOG(LIBOR)	0.7892	0.2453	-1.9045	0.1842	
	1.8132*	2.3816**	-3.3275***	0.4751	
LOG(POP)	0.0491		1.6569	-1.1652	
	2.9306***		5.2992***	-1.7945*	
LOG(TAX_REV)	-0.1255	0.1814	0.2053	0.1950	-0.3790
	-2.8310***	3.6784***	1.8199*	3.8780***	-0.9813
LOG(TRADE)	2.9946	0.2659	0.1722	-0.1266	0.3340
	2.7189***	4.4216***	1.9396*	-2.6002***	6.2207***
R-squared	0.9989	0.9987	0.9990	0.9967	0.9960
F-statistic	3481.1270	3767.5160	2995.9870	883.4936	1512.6120
Breusch-Pagan-Godfrey (Prob. F)	0.338	0.982	0.126	0.096	0.052
LM Test (Prob. F)	0.052	0.872	0.783	0.098	0.462

Source: Data processed, 2023

Indonesia

a. The regression results show the relationship between the independent variable (INV, ER, IVA, LIR, LIBOR, POP, TAX_REV, TRADE) and the dependent variable (which is not mentioned in the output). Here is the analysis of the coefficients and t-statistics for each variable:
b. LOG(INV): Coefficient of 0.3552 with a t-statistic of 6.1183 (significant at the level of 1% due to t-statistic > 2, and *** indicates a significance of 1%). This means that every 1% increase in investment (INV) will increase Indonesia's economic growth by 0.3552%.
c. LOG(ER): Coefficient of 0.0369 with a t-statistic of 1.2321 (insignificant due to t-statistic < 2). This shows that the exchange rate (ER) does not have a significant influence on Indonesia's economic growth in this model.
d. LOG(IVA): Coefficient 0.3135 with a t-statistic of 3.5111 (significant at the level of 1%, ***). This shows that industrial value added (IVA) has a significant positive effect on Indonesia's economic growth. A 1% increase in IVA will increase economic growth by 0.3135%.
e. LIR (Interest Rate): Coefficient -0.1138 with a t-statistic of -0.3281 (insignificant due to t-statistic < 2). This shows that the interest rate (LIR) has no significant influence on Indonesia's economic growth.
f. LOG(LIBOR): Coefficient of 0.7892 with a t-statistic of 1.8132 (significant at the 10% level due to the t-statistic > 1, but not significant at the 5% level). This shows that LIBOR (London Interbank Offered Rate) has a positive effect on Indonesia's economic growth, although the effect is not so strong at a higher level of significance.
g. LOG(POP): Coefficient 0.0491 with a t-statistic of 2.9306 (significant at the level of 1%, ***). Population has a significant positive influence on economic growth, with every 1% increase in population increasing economic growth by 0.0491%.
h. LOG(TAX_REV): Coefficient -0.1255 with a t-statistic of -2.8310 (significant at the level of 1%, ***). Tax revenue (TAX_REV) has a significant negative effect on Indonesia's economic growth in this model.
i. LOG(TRADE): Coefficient of 2.9946 with a t-statistic of 2.7189 (significant at the rate of 1%, ***). Trade (TRADE) has a significant positive influence on Indonesia's economic growth.
j. Breusch-Pagan-Godfrey (Prob. F) = 0.338: This test is used to test heteroscedasticity. A p-value greater than 0.05 indicates that there is no heteroscedasticity problem in this model, or in other words, the error variance is not variable (homoscedastic).
k. LM Test (Prob. F) = 0.052: This test is used to detect autocorrelation in regression models. A p-value slightly smaller than 0.05 indicates that there is an indication of autocorrelation, albeit only slightly, which means that some errors in the model may be intercorrelated. This needs further attention and may need to be modified the model, such as using regression models with correction for autocorrelation.

Overall, the regression model shows that structural factors such as industry, trade, and population have a major impact on Indonesia's economic growth, while external factors such as interest rates and exchange rates do not show significant influences.

Singapore

a. INF (Inflation): Coefficient: -0.0076 and T-statistic: -2.3803 (significant at the rate of 1%, ***). This shows that inflation has a significant negative influence on Singapore's economic growth. Any 1% increase in inflation will reduce economic growth by 0.0076%. This effect is quite significant, which is consistent with the literature showing that high inflation usually inhibits economic growth.
b. LOG(ER) (Exchange Rate): Coefficient: 0.0840 and T-statistic: 1.1656 (insignificant due to t-statistic < 2). The exchange rate (ER) does not have a significant influence on Singapore's economic growth in this model. Although there are positive coefficients, they are not strong enough to show a statistically significant influence.
c. LOG(IVA) (Industrial Added Value): Coefficient: 0.4128 and T-statistic: 3.2478 (significant at the rate of 1%, ***). Industrial value added (IVA) has a significant positive effect on Singapore's economic growth. Any 1% increase in industrial value added will increase economic growth by 0.4128%, indicating that the industrial sector plays an important role in supporting Singapore's economy.
d. LOG(LIBOR) (London Interbank Offered Rate): Coefficient: 0.2453 and T-statistic: 2.3816 (significant at the rate of 5%, **). LIBOR has had a significant positive influence on Singapore's economic growth.

A 1% increase in LIBOR will increase Singapore's economic growth by 0.2453%. This effect is quite significant at the level of 5%.

e. LOG(TAX_REV) (Tax Revenue): Coefficient: 0.1814 and T-statistic: 3.6784 (significant at the rate of 1%, ***). Tax revenue (TAX_REV) has a significant positive influence on Singapore's economic growth. A 1% increase in tax revenue will increase economic growth by 0.1814%, which indicates that effective fiscal policy has a positive impact on the economy.
f. LOG(TRADE) (Trade): Coefficient: 0.2659 and T-statistic: 4.4216 (significant at the rate of 1%, ***). Trade (TRADE) has a very significant positive influence on Singapore's economic growth. Any 1% increase in trading volume will increase economic growth by 0.2659%. This illustrates the importance of international trade for the economy of Singapore, which is one of the countries with an open economy.
g. Breusch-Pagan-Godfrey (Prob. F) = 0.982: This test is used to detect the presence of heteroscedasticity in the regression model. A p-value much greater than 0.05 indicates that there is no heteroscedasticity problem, or in other words, the model does not undergo a systematic change in error variance (homoscedastic).
h. LM Test (Prob. F) = 0.872: This test is used to detect autocorrelation in residuals. A very large p-value (more than 0.05) indicates that there is no autocorrelation in this regression model, which means that the errors in the model are not interrelated, and the model can be considered free of autocorrelation.

Overall, these findings show that factors such as inflation, industrial value-added, tax policy, and trade have a major influence on Singapore's economic growth. However, exchange rate variables do not contribute significantly to this model.

Malaysia

a. INF (Inflation): Coefficient: -0.0150 and T-statistic: -2.5787 (significant at the rate of 1%, ***). Inflation shows a significant negative influence on Malaysia's economic growth. Any 1% increase in inflation will reduce economic growth by 0.0150%. This indicates that high inflation has the potential to hinder economic growth.
b. LOG(INV) (Investment): Coefficient: 0.2021 and T-statistic: 2.4839 (significant at the rate of 5%, **). Investment has a significant positive influence on economic growth. Every 1% increase in investment will increase Malaysia's economic growth by 0.2021. This shows that investment is an important factor in supporting the country's economic growth.
c. LOG(LIBOR) (London Interbank Offered Rate): Coefficient: -1.9045 and T-statistic: -3.3275 (significant at the rate of 1%, ***). LIBOR has a significant negative influence on Malaysia's economic growth. Any 1% increase in LIBOR will decrease economic growth by 1.9045%. This may reflect the impact of high international interest rates on domestic borrowing and investment costs.
d. LOG(POP) (Population): Coefficient: 1.6569 and T-statistic: 5.2992 (significant at the rate of 1%, ***). Population has a significant positive influence on economic growth. Every 1% increase in population will increase Malaysia's economic growth by 1.6569%. This shows the importance of demographic factors in driving economic activity.
e. LOG(TAX_REV) (Tax Revenue): Coefficient: 0.2053 and T-statistic: 1.8199 (significant at the rate of 10%, *). Tax revenues have a positive effect on economic growth, although the effect is not as strong as other variables. A 1% increase in tax revenue will increase Malaysia's economic growth by 0.2053%.
f. LOG(TRADE) (Trade): Coefficient: 0.1722 and T-statistic: 1.9396 (significant at the level of 10%, *). Trade has a positive influence on Malaysia's economic growth, although the influence is not as strong as other variables. Any 1% increase in trading volume will increase economic growth by 0.1722%.
g. LOG(ER) (Exchange Rate): Coefficient: 0.1427 and T-statistic: 1.1201 (insignificant due to t-statistic < 2). The exchange rate (ER) does not show a significant influence on Malaysia's economic growth in this model.
h. LOG(IVA) (Industrial Added Value): Coefficient: 0.0931 and T-statistic: 0.6190 (insignificant due to t-statistic < 2). Industrial value added (IVA) has no significant influence on Malaysia's economic growth based on this regression result.
i. LIR (Interest Rate): Coefficient: 0.0064 and T-statistic: 0.8274 (insignificant due to t-statistic < 2). The interest rate (LIR) does not show a significant influence on Malaysia's economic growth in this model.

j. Breusch-Pagan-Godfrey (Prob. F) = 0.126: The Breusch-Pagan test is used to test for the presence of heteroscedasticity. A p value greater than 0.05 (i.e. 0.126) indicates that there is no heteroscedasticity problem in this model, or in other words, the error variance is not variable (homoscedastic).
k. LM Test (Prob. F) = 0.783: The LM test is used to test for the presence of autocorrelation. A p-value greater than 0.05 (i.e. 0.783) indicates that there are no autocorrelation problems in this model, which means that errors in the model are not intercorrelated and the model can be considered auto-free.

Overall, these findings show that factors such as inflation, investment, LIBOR, population, tax revenue, and trade have a significant impact on Malaysia's economic growth. Meanwhile, exchange rate variables, industrial value-added and interest rates did not show significant influence.

Thailand

a. LOG(INV) (Investment): Coefficient: -0.1537 and T-statistic: -2.7022 (significant at the rate of 1%, ***). Investment shows a significant negative influence on Thailand's economic growth. Any 1% increase in investment will reduce economic growth by 0.1537%. This may indicate that although investment is important, there are other factors that affect the impact of investment on the Thai economy during this period.
b. LOG(ER) (Exchange Rate): Coefficient: 0.2232 and T-statistic: 3.3225 (significant at the rate of 1%, ***). The exchange rate has a significant positive influence on Thailand's economic growth. Every 1% increase in the exchange rate will increase economic growth by 0.2232%. This shows that positive exchange rate fluctuations support Thailand's economic growth.
c. LOG(IVA) (Industrial Added Value): Coefficient: 1.2182 and T-statistic: 10.1643 (significant at the rate of 1%, ***). The added value of the industry has a very strong and significant influence on Thailand's economic growth. Every 1% increase in industrial value added will increase economic growth by 1.2182%. This shows the importance of the industrial sector to the Thai economy, with a huge contribution to its growth.
d. LOG(TAX_REV) (Tax Revenue): Coefficient: 0.1950 and T-statistic: 3.8780 (significant at the rate of 1%, ***). Tax revenues have a significant positive effect on economic growth. Any 1% increase in tax revenue will increase Thailand's economic growth by 0.1950%. This shows that fiscal policies and good tax management can drive economic growth.
e. LOG(TRADE) (Trade): Coefficient: -0.1266 and T-statistic: -2.6002 (significant at the rate of 1%, ***). Trade has a significant negative influence on Thailand's economic growth. Any 1% increase in trading volume will reduce economic growth by 0.1266%. This suggests that although international trade is generally profitable, in this context, the increase in trade may be related to negative factors such as trade imbalances or dependence on imports.
f. INF (Inflation): Coefficient: -0.0023 and T-statistic: -1.1237 (insignificant due to t-statistic < 2). Inflation does not have a significant influence on Thailand's economic growth in this model.
g. LIR (Interest Rate): Coefficient: -0.0045 and T-statistic: -1.4678 (insignificant due to t-statistic < 2). Interest rates do not show a significant influence on Thailand's economic growth in this model.
h. LOG(LIBOR) (London Interbank Offered Rate): Coefficient: 0.1842
i. T-statistic: 0.4751 (insignificant due to t-statistic < 2). LIBOR has no significant influence on Thailand's economic growth in this model.
j. LOG(POP) (Population): Coefficient: -1.1652 and T-statistic: -1.7945 (significant at the rate of 10%, *). Population has a negative influence on Thailand's economic growth, although the influence is only significant at a rate of 10%. Any 1% increase in population will decrease economic growth by 1.1652%. This suggests that demographic factors can have a negative impact, perhaps due to challenges associated with population increase, such as the need for more infrastructure or employment issues.
k. Breusch-Pagan-Godfrey (Prob. F) = 0.096: The Breusch-Pagan test is used to test for heteroscedasticity. A p-value smaller than 0.05 (i.e. 0.096) indicates the existence of a possible heteroscedasticity, which means that the variance of error may not be constant. This is worth noting because heteroscedasticity can affect the accuracy of coefficient estimation in regression models.
l. LM Test (Prob. F) = 0.098: The LM test is used to test for autocorrelation. A p-value smaller than 0.05 (i.e. 0.098) indicates that there is an indication of autocorrelation in this model. This means that errors

in the model may be intercorrelated, which need to be corrected to improve the reliability of the model, for example by using regression models that correct for autocorrelation.

Overall, these findings show that the industrial sector, fiscal policy, and exchange rate fluctuations have a significant influence on Thailand's economic growth, while factors such as inflation and international interest rates do not show significant influences.

Philippines

a. NF (Inflation): Coefficient: -0.0062 and T-statistic: -1.9852 (significant at the rate of 5%, ***). Inflation has a negative influence on the growth of the Philippine economy. Any 1% increase in inflation will reduce economic growth by 0.0062%. This suggests that high inflation has the potential to hamper economic growth in the Philippines.
b. LOG(IVA) (Industrial Added Value): Coefficient: 0.4207 and T-statistic: 4.4900 (significant at the rate of 1%, ***). The added value of the industry has a significant positive influence on the Philippines' economic growth. Any 1% increase in industrial value added will increase economic growth by 0.4207%. This shows that the industrial sector is crucial in driving economic growth in the Philippines.
c. LOG(TRADE) (Trade): Coefficient: 0.3340 and T-statistic: 6.2207 (significant at the rate of 1%, ***). Trade has a very strong positive influence on the growth of the Philippine economy. Any 1% increase in trade will increase economic growth by 0.3340%. This shows that international trade is an important factor in driving the growth of the Philippine economy.
d. LOG(INV) (Investment): Coefficient: -0.0646 and T-statistic: -1.7247 (significant at the rate of 10%, *). Investment has a negative influence on the growth of the Philippine economy, although the effect is only significant at the rate of 10%. Every 1% increase in investment will decrease economic growth by 0.0646%. Although significant at the rate of 10%, these negative effects need to be analysed further, as they may be influenced by other external or internal factors in the economy.
e. LOG(TAX_REV) (Tax Revenue): Coefficient: -0.3790 and T-statistic: -0.9813 (insignificant due to t-statistic < 2). Tax revenues do not have a significant influence on Philippine economic growth in this model.
f. Breusch-Pagan-Godfrey (Prob. F) = 0.052: The Breusch-Pagan test is used to test for the presence of heteroscedasticity. A p-value slightly smaller than 0.05 (i.e. 0.052) suggests that there may be a heteroscedasticity problem in this model. This means that the variance of the error may not be constant, which could affect the estimated coefficients in the model. Therefore, further testing or improvement of the model is required to ensure the stability of the estimates.
g. LM Test (Prob. F) = 0.462: The LM test is used to test for the presence of autocorrelation. A p-value greater than 0.05 (i.e. 0.462) indicates that there are no autocorrelation issues in this model. This means that the errors in the model are not correlated with each other, which increases the reliability of the regression results.

Overall, these findings show that the industrial and trade sectors have a huge influence on the growth of the Philippine economy. Inflation and investment also have an impact, although the effects are more complex.

Effect of Industrial Value Added (IVA)

Industrial value added refers to the contribution of the industrial sector to gross domestic product (GDP). The industrial sector plays a vital role in driving economic growth as it serves as a key driver of job creation, productivity increase, and technological innovation. ASEAN countries such as Indonesia, Malaysia, and Singapore show that industrial added value has a significant positive influence on economic growth.

In the Indonesian context, the industrial sector, especially manufacturing, has shown a significant contribution to economic growth. Aswicahyono, et al (2013) stated that the industrial sector can accelerate the industrialization process and increase the competitiveness of Indonesia's economy, which in turn supports economic growth. The study also shows that increased industrial value leads to the creation of new jobs that increase domestic consumption, which supports economic growth.

In Malaysia, the manufacturing and technology industries also play an important role in economic growth. Webster (2014) in their research show that the manufacturing sector, especially in

technology and automotive, has become a key economic driving sector that increases the contribution of the industrial sector to Malaysia's GDP. The increase in industrial added value in Malaysia contributes to economic diversification and reduced dependence on the natural resources sector.

Singapore, which relies on high-tech and manufacturing, also shows a positive link between industrial added value and economic growth. Cheang (2024) suggest that Singapore, with its strong technology and financial sectors, shows how innovation in the industrial sector can increase efficiency and productivity, ultimately driving economic growth.

Influence of Tax Revenue

Tax revenues are the main source of government revenue used to finance public development and spending, including infrastructure, education, and health. ASEAN countries that have an efficient tax system can increase their fiscal capacity to fund projects that can drive economic growth.

In Indonesia, increased tax revenues allow the government to increase investment in infrastructure and education, which in turn boosts productivity and economic growth. Nasution (2017) show that higher tax revenues are closely related to increased state fiscal capacity, which supports long-term development.

Malaysia shows a positive relationship between tax revenues and economic growth. Chong et al. (2022) found that successful tax reform can improve the country's fiscal effectiveness, as well as strengthen the sectors that support the economy. With higher tax revenues, Malaysia can improve the quality of public services and infrastructure that accelerates economic growth.

Singapore, known for its efficient tax system, leverages tax revenues to finance innovation and technology, as well as improve global competitiveness. Tan & Bhaskaran (2015) emphasized that progressive and efficient tax policies have helped Singapore diversify its economy and reduce dependence on certain sectors.

The Effect of Trade Value (TRADE)

The value of trade shows the importance of international trade as a driver of economic growth. ASEAN countries that are more open to international trade tend to show higher economic growth. International trade improves market access, facilitates foreign direct investment (FDI) flows, and introduces new technologies that can increase productivity.

In Indonesia, international trade contributes to increased exports and reduces dependence on the domestic market. Soesastro & Basri (2005) stated that international trade helps Indonesia diversify its economic base, especially by increasing non-oil and gas exports that are more sustainable.

Malaysia, as one of the countries that relies heavily on exports, shows a significant link between trade value and economic growth. Haseeb, et al (2014) found that the export sector, especially electronic products and commodities, plays a major role in boosting Malaysia's economic growth through higher trade value.

Singapore is an example of a country with very strong international trade relations. Siddiqui (2010) show that the high value of trade allows Singapore to leverage its position as a global logistics hub, which accelerates economic growth by strengthening the country's competitive position in international trade.

The Effect of Inflation

Inflation can negatively affect economic growth because high inflation often leads to economic instability, decreased people's purchasing power, and investment uncertainty. Several countries in ASEAN such as Singapore, Malaysia, and the Philippines have experienced a negative impact of inflation on economic growth, which can be explained as follows. Singapore is a country with a very open economy and depends on international trade, and has a strong economic structure oriented towards the service and manufacturing sectors. High inflation can reduce the competitiveness of Singapore's economy, especially in the export and manufacturing sectors. A study by Marasanti & Verico (2024) suggests that higher inflation can lead to a decrease in consumer purchasing power, which in turn reduces domestic demand and investment. This will slow down the pace of economic growth in Singapore, which relies heavily on price stability and people's purchasing power.

High inflation in Malaysia can affect consumer purchasing power, increase production costs, and reduce company profits, which ultimately negatively impacts economic growth. Arapova (2018) found

that high inflation reduces household purchasing power and increases economic uncertainty, which in turn reduces domestic consumption and investment. In addition, inflation can also increase input costs in the industrial sector, which hinders productivity and economic growth.

In the Philippines, high inflation can reduce household purchasing power and lower domestic consumption, contributing to declining economic growth. Chen (2022) stated that high inflation can lead to social and economic instability, which reduces investment and slows economic growth. In addition, high inflation in the Philippines is often accompanied by a decline in currency exchange rates, which increases import costs and reduces consumer purchasing power. High inflation in the Philippines can exacerbate income inequality and reduce people's purchasing power, ultimately hampering domestic demand. Platitas & Ocampo (2025) in their research showed that high inflation can reduce the growth of the consumer sector and reduce the potential for expansion of the manufacturing sector which is important for the Philippines.

Influence of Labor

Labor is one of the important factors in economic growth because a productive workforce will encourage an increase in economic output. In countries such as Indonesia, Singapore, and Malaysia, the workforce has a positive influence on economic growth, as the increase in the number and quality of the workforce is directly related to productivity and economic competitiveness. In Indonesia, increasing a skilled and educated workforce can drive economic growth. Avirutha (2021) show that with the growth of the manufacturing and digital sectors, a skilled workforce can increase productivity, which leads to an increase in economic output. A more skilled workforce increases efficiency and strengthens Indonesia's competitiveness in the global market. Improved labor quality in Indonesia's leading sectors, such as agriculture and manufacturing, contributes to higher economic growth.

Singapore has invested a lot of resources in upskilling its workforce. Hartley, et al (2018) suggest that with the quality of a highly skilled and educated workforce, Singapore has succeeded in encouraging high-tech and innovation-based sectors, which in turn drives economic growth. Increased investment in education and training in Singapore has led to increased productivity, especially in the high-tech services and manufacturing sectors. Workforce skills development policies enable countries to maintain competitiveness in global markets and drive economic growth.

The workforce in Malaysia has made a positive contribution to economic growth, especially with the increase in the manufacturing and technology sectors. Nyeow (2023) show that a more skilled workforce increases productivity, which in turn drives Malaysia's economic growth. The development of the education and workforce training sector in Malaysia strengthens the country's competitiveness. Increased investment in education and workforce skills can accelerate Malaysia's economic growth through sectors such as manufacturing, electronics, and information technology. The quality of the workforce in Malaysia plays a crucial role in improving the efficiency of the export-based sector, which is crucial in driving economic growth.

Overall, high inflation in Singapore, Malaysia, and the Philippines leads to a decline in people's purchasing power and economic uncertainty, which lowers economic growth. On the other hand, the quality and number of skilled workers in Indonesia, Singapore, and Malaysia have a positive impact on productivity and economic growth. These two factors emphasize the importance of efficient management of economic policies to promote sustainable economic growth.

CONCLUSION

Industrial Value Added (IVA): Almost all countries in the sample show a significant positive influence of industrial value added on economic growth. This shows that the industrial sector is very important to accelerate economic growth in ASEAN countries.

TRADE: Most countries show a significant positive influence of trade on economic growth. This shows that the integration of the economy with global markets plays an important role.

Tax Revenue: Some countries (such as Singapore and Malaysia) show significant positive influences from tax revenues, demonstrating the importance of effective fiscal policies in supporting economic growth.

Inflation (INF): Some countries, such as Singapore, Malaysia, and the Philippines, show a negative influence of inflation on economic growth. This suggests that high inflation can hamper economic growth in these countries, which needs to be carefully managed through monetary and fiscal policies.

Investment (INV): In the Philippines and Thailand, investment appears to have a negative influence on economic growth. This can be due to external or internal factors that affect the effectiveness of investments in these two countries.

Exchange Rates and Interest Rates do not always show significant influence on economic growth in these countries, suggesting that these external factors may be influenced by broader global dynamics.

Populations show negative influences in some countries (such as Thailand), which may reflect the challenges associated with managing a growing population.

Improving Fiscal and Investment Policies: ASEAN countries need to formulate effective fiscal policies, optimize tax revenues, and create a conducive investment climate. By improving the tax system and providing incentives for long-term investment, these countries can increase economic growth in a more stable and sustainable manner.

Population Management and Employment: Some countries like Thailand and the Philippines are facing challenges related to the ever-growing population numbers. Therefore, policies that target improving the quality of the workforce and education are essential to harness the existing demographic potential.

Limitations This study is a study using static panel linear regression and does not consider dynamic effects such as economic growth lag or variables that are influenced by previous time. This can reduce the accuracy in capturing the long-term relationships between variables. Some variables in the model, such as investment and trade, are likely to have a two-way relationship with economic growth. However, this study has not explicitly addressed the potential endogeneity problem, which may affect the validity of the regression coefficient estimate.

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