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THE DYNAMICS BETWEEN MACROECONOMIC INDICATORS TOWARDS ECONOMIC GROWTH AMONG ASEAN-5 COUNTRIES USING PANEL ANALYSIS

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ABSTRACT

This study aims to identify the most appropriate model for conducting panel data analysis on the macroeconomic indicators towards the economic growth in ASEAN-5 countries. The research focuses on five countries: Malaysia, Singapore, Thailand, Philippines, and Indonesia, covering the period from 1980 to 2019. The independent variables under investigation include inflation, percentage of money supply to GDP, trade openness, and population. Three models are utilized including the common constant model, fixed effect model, and random effects model. To determine the most suitable model, the researchers employ the Redundant fixed effects test and the Hausman test for specification testing. The fixed effect model emerges as the most adequate model. The significant P-values obtained from both tests provide evidence in favor of the fixed effect model, indicating that it is the most appropriate choice for understanding the relationships between the independent variables and economic growth in the ASEAN-5 countries. The findings of the fixed effect model show that inflation and money supply are negatively and significantly related to economic growth at the 1% level. Trade openness is positively related to economic growth, but not significantly. Additionally, the population has a significantly positive relationship with economic growth.

INTRODUCTION

The growth in Gross Domestic Product (GDP) is a common indicator, which is concerned by every country. GDP growth represents the country's economic growth. A positive value in GDP means the expansion of the economy. In contrast, when GDP is negative, it means the contraction of the economy. GDP growth is important because it is not only considered the indicator for economic growth only, it also will be used to measure the performance of the government. When economic growth is positive, it led to the effectiveness of the government policy and increases the confidence of the people in the government. If the economy is negative for a long time, it brings political instability. Besides that, economic growth is also a consideration for the foreign investor. When the economic growth is positive, it means that the optimistic for future investment. The tendency to profit gives the confidence to foreign investors to increase their investment to boost their capital. If negative economic growth, they will try to remove their capital and invest in another country to prevent the loss. Hence, GDP growth is an important indicator of the economy and politics in a country.

Southeast Asia is a subregion of Asia located in the southeastern part of the continent. It is a diverse and dynamic region known for its rich cultural heritage, natural beauty, and economic significance. Southeast Asia comprises eleven countries, including mainland countries such as Thailand, Myanmar, Laos, Cambodia, Vietnam, and the island nations of Malaysia, Singapore, Indonesia, Brunei, the Philippines, and Timor-Leste. Geographically, the region is characterized by a mix of landscapes, ranging from dense tropical rainforests, mountain ranges, and fertile river deltas to stunning coastlines and beautiful islands. The equatorial climate in many parts of Southeast Asia provides a warm and humid environment throughout the year. Importantly, Southeast Asia has historically been a critical region in international trade due to its strategic location as a crossroads between the Indian Ocean and the Pacific Ocean. This geographical advantage has made Southeast Asia a crucial region for global trade routes, connecting major markets in Asia, Europe, and more. Economically, Southeast Asia is a rapidly developing region with significant growth potential. It is known for its strategic location, natural resources, and burgeoning markets. The countries of Southeast Asia are increasingly attracting investments, becoming major players in international trade, manufacturing, and tourism.

However, Southeast Asia consists of different thresholds and categories of countries as shown in Table 1. For instance, Singapore and Brunei are categorized as high-income countries and developed countries. Meanwhile, Malaysia and Thailand are grouped into upper-middle-income countries and developing countries. Other countries, such as Indonesia, Philippines, Myanmar, Cambodia, Laos, Timor Leste, and Vietnam are the lower-middle income countries and developing countries. This circumstance indicates that different income threshold has different potential in the economy. Although the eleven countries are in the same region and have one body of the economy, which is the ASEAN Free Trade Area (AFTA), but the competition still exists between each other. Southeast Asian countries often compete for foreign direct investment (FDI) and access to global markets. They strive to attract investments by offering incentives, improving business environments, and enhancing infrastructure. This competition aims to boost industrialization, create jobs, and improve economic growth. Access and control of natural resources, oil, gas, minerals, and agricultural land, can create tensions among countries. Disputes over territorial waters in the South China Sea, for example, have led to geopolitical rivalries and competition for resources in the region.

Table 1: GNI per capita and the categories of nations in 2022

Country	GNI per capita (US $)	Threshold Income	Categories
Singapore	67 200	High	Developed country
Brunei	31 410	High	Developed country
Malaysia	11 780	Upper-middle	Developing country
Thailand	7 230	Upper-middle	Developing country
Indonesia	4 580	Lower-middle	Developing country
Vietnam	4010	Lower-middle	Developing country
Philippines	3 950	Lower-middle	Developing country
Laos	2 360	Lower-middle	Developing country
Timor Leste	1 970	Lower-middle	Developing country
Cambodia	1 700	Lower-middle	Developing country
Myanmar	1 210	Lower-middle	Developing country

Sources: World Bank, 2023 and OECD, 2023

Table 2: The thresholds for income classification 2022

Threshold Income	GNI per capita, 2022 ($)
Lower	Lower than 1085
Lower-middle	1,086 – 4,255
Upper-middle	4,256 – 13,205
High	More than 13,205

Source: World Bank, 2023

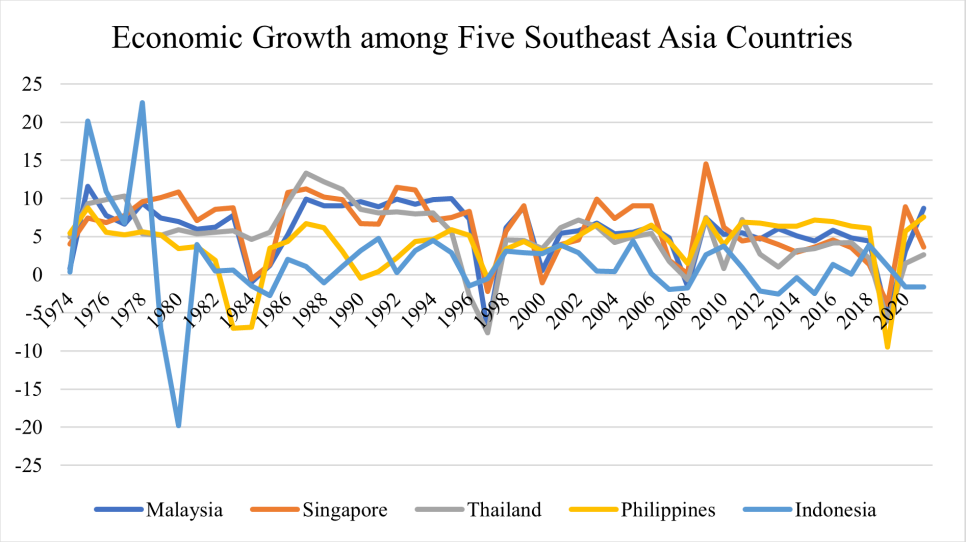

Figure 1: Economic Growth among Five Southeast Asia Countries, 1974 - 2021

Sources: World Bank, 2023

A high-income country, not indicated that it always has positive economic growth. In other words, a low-income country does not necessarily always has negative economic growth. However, the stability of economic growth becomes a crucial role to determine the better performance of economic growth. From Figure 1, it is observed that the trend of economic growth among the ASEAN-5 countries is almost the same. However, when observed clearly, it is found that the different trends of economic growth during the economic crisis. For instance, the ASIAN financial crisis, the Great Recession, and the COVID-19 pandemic crisis. During the Great Recession, Malaysia, Thailand, and Indonesia faced economic recession, and achieve negative economic growth. However, Singapore and the Philippines obtained positive economic growth. Besides that, it is observed that the economic growth of Singapore is more stable than Malaysia, Thailand, Philippines, and Indonesia. The fluctuation of the growth is smaller in the Singapore case.

Economic growth is influenced by other factors. Economic growth has a strong correlation with unemployment. When there is economic growth, it means that job opportunity is sufficient to maintain lower unemployment. The Phillips curve suggests a tradeoff between unemployment and inflation, implying that there is an inverse relationship between these two variables. Specifically, when unemployment is high, inflation tends to be low, and vice versa. An raise in the supply of money can have a boosting effect on the economy by encouraging higher levels of consumer spending. As money supply rises, people have more money in hand, leading to an increase in consumption. This raises aggregate expenditure and contributes to an overall increase in the national income. In summary, an increment in the money supply can boost economic activity by promoting higher consumer spending and ultimately leading to higher national income. Furthermore, trade openness involves both exports and imports and also exerts an impact on economic growth. Export activities lead to cash inflow, as goods and services are sold to foreign markets and generate revenue for the country. On the other hand, imports result in cash outflow, as the country purchases goods and services from foreign sources. Both export and import activities play a significant role in shaping the overall trade balance and can have implications for a nation's economic growth. In addition, a larger population can provide a labor force advantage to a country. With a substantial labor force, the country can experience increased production capacity, leading to enhanced economic growth. The availability of adequate labor can also lead to lower labor costs. Thus, this makes it more cost-effective for businesses to operate, which further contributes to higher economic growth. Overall, a high population can offer significant benefits in terms of workforce potential and cost advantages, driving the nation's growth.

RESEARCH OBJECTIVE

The overall objective is to analyze the impact of macroeconomic indicators, such as inflation, percentage of money supply to GDP, trade openness, and population on the economic growth in five selected Southeast Asian countries.

LITERATURE REVIEW

Factors influencing economic growth had been investigated by several methods, which comprising of Ordinary Least Square (OLS) (Próchniak, 2011), Autoregressive Distributed Lag (ARDL) (Thaddeus et al., 2021), Vector Autoregression (VAR) (Dritsakis et al., 2006), and Vector Error Correction (VECM) (Abdalla and Hisham, 2015). This study will adopt the panel analysis to investigate the relationship of selected determinants, namely inflation, percentage of the money supply to GDP, trade openness, and population with economic growth among ASEAN-5 countries.

Hoang (2021) stressed the nonlinear connection of inflation towards GDP growth in Vietnam. He noted that the negative impact of inflation on GDP growth took place when inflation is more than 6 percent. However, when inflation is less than 6 percent, it helped to improve economic growth. Ioan et al. (2020) applied the impact of factors between inflation on the economic growth of India, Brazil, and Romania from the period 2005-2017. Researchers found selected countries revealed that inflation was negatively associated with economic growth.

Chaitip et al. (2015)Indonesia, Singapore, Malaysia, Philippines, Vietnam, Lao PDR and Cambodia. The macro variables comprise of economic growth-wide phenomena or GDP growth rates and money growth-wide phenomena or money supply, consisting of money (M1 used Autoregressive Distributed Lag (ARDL) approach, specifically the Pooled Mean Group Estimator (PMGE) to develop long-run and the short-run dynamics or the adjustment speed to the long-run equilibrium between supply of money towards economic growth by focusing on Thailand, Indonesia, Singapore, Malaysia, Philippines, Vietnam, Lao PDR, and Cambodia. They found that the Pooled Mean Group estimator was the most suitable and appropriate method to examine the dynamics between money supply and economic growth in the selected ASEAN Economic Community (AEC) countries. The use of this estimator provided the most accurate and reliable insights into how changes in money supply relate to economic growth across the AEC region. Hussain, et al. (2017) denoted that the percentage of broad money to GDP had a significant positive impact on economic growth in Bangladesh. In addition, García and Viet (2021) examine how money supply affects economic growth rate, inflation rate, exchange rate, and real interest rate using a panel dataset comprising 217 countries from 1960 to 2020. They urged that there is a negative correlation between the money growth rate and the GDP growth rate.

Nasreen and Anwar (2014) pointed out the causal relationship between economic growth, trade openness, and energy consumption in 15 Asian countries. The study encompasses data from the 1980 to 2011. The analysis used panel cointegration and causality approaches to explore both the long-run relationship and the direction of causality between variables. By using these methods, the study discovered that bidirectional between GDP growth and trade openness. Besides that, the relationship between both variables exhibited a positive relationship. The statement was supported by Rahman et al. (2017), which stated that there was a bidirectional between trade openness and economic growth. However, Ulaşan (2015) gave another view on this statement. He claimed that higher economic growth did not happen when the trade barrier was lower. This means liberalization did not associate with boost in trade to help increase the economic development of nations.

The relationship between growth in population and growth in economic had been explored by Rahman et al. (2017). They adopted the annual data from 1960-2013 among three major developed countries, namely the United States, United Kingdom, and Canada with three major emerging developing countries, comprising China, India, and Brazil. In their findings, they concluded that the increase in population growth enhanced the economic growth among these six countries. Peter and Bakari (2018) stressed how population growth affects the economic growth in African countries, employing an approach using panel data from 1980 to 2015. The findings from both the difference and system GMM methods indicate that population growth has a positive influence on the economic growth for Africa.

METHODOLOGY

Source of data

The data for the annual growth rate of real Gross Domestic Product (GDPG) and its corresponding independent variables, including inflation rate (INF), percentage of money supply to GDP (MS), trade openness (TRADE), and population (POP), have been collected for the period from 1980 to 2019. The data covers five Southeast Asian countries, which are Malaysia, Singapore, Thailand, Philippines, and Indonesia.

Model Specification

The model can be described as follows:

$GDPG = f(INF, MS, TRADE, POP)$……(1)

$GDPG_{it} = \beta_{0it} + \beta_1 INF_{it} + \beta_2 MS_{it} + \beta_3 TRADE_{it} + \beta_4 POP_{it} + m_{it}$……(2)

Where:

GDP	= Growth rate of real Gross Domestic Product (GDP)
INFL	= Inflation
MS	= Percentage of the money supply to GDP
TRADE	= Trade Openness
POP	= Population
m	= Error term

Empirical Methodology

In this study, three models are employed to analyze the data including the common constant model, the fixed-effect model, and the random-effect model. A balanced panel dataset is used, meaning that there is an equal number of observations for each cross-section or country.

To determine the most suitable model among the three models mentioned earlier, two tests are conducted. The first test is the Redundant Fixed Effects test, which helps assess whether including fixed effects in the model is necessary or if they can be omitted without losing important information. The second test is the Hausman Test, specifically used to examine the presence of correlated random effects. It helps determine whether the random-effect model is more appropriate than the fixed-effect model by evaluating whether the random effects are independent of the independent variables (Gujarati and Porter, 2009).

Both these tests play a crucial role in selecting the appropriate model for this study's panel data analysis.

Common constant model

Common constant model is also known as the pooled Ordinary Least Squares (OLS) method. This model is an estimation technique that assumes there are no variations or differences among the data matrices in the cross-sectional dimension. In other words, it treats all cross-sectional units (countries in this case) as if they belong to a single group with no distinct characteristics.

The model assumes that there are no significant differences between the estimated cross-sectional units. It is implying that the relationship between the dependent variable and independent variables is uniform across all countries. This assumption is particularly useful when the dataset is considered to be a priori homogeneous, meaning that there are no known systematic differences or heterogeneity among the countries before the analysis.

The common constant model involves combining all the data points from different countries and estimating a single regression equation to find the overall relationship between the variables. However, it is important to note that this approach might overlook potential variations and unique characteristics that individual countries might possess. Hence, the equation of the common constant model is as below:

$$GDPG_{it} = \beta_{0i} + \beta_1 INF_{it} + \beta_2 MS_{it} + \beta_3 TRADE_{it} + \beta_4 POP_{it} + m_{it} \ldots\ldots (3)$$

Where:

ith = cross-sectional unit

t = *t*he time period

Fixed effects model

The fixed effects model allows for the inclusion of different constants for each cross-sectional unit (country) in the analysis. It is also known as the least squares dummy variables (LSDV) estimator, which enables the estimation of separate constants for each group by incorporating dummy variables.

In the fixed effects model, a unique dummy variable is introduced for each group (country), representing the differences specific to that group. These dummy variables capture the individual characteristics of each country that might influence the dependent variable differently. By including these dummy variables, the model accounts for the specific effects associated with each cross-sectional unit.

Through the fixed effects model, the analysis recognizes and accounts for the inherent heterogeneity and distinctiveness among the countries. The fixed effect model allows for a more precise estimation of the relationships between the dependent and independent variables for each country individually. This approach is particularly useful when dealing with panel data as it considers both the within-group variations and the overall relationship between the variables. Thus, the equation of the fixed-effects model is as below:

$$GDPG_{it} = \alpha_1 + \alpha_2 D_{2i} + \alpha_3 D_{3i} + \alpha_4 D_{4i} + \alpha_5 D_{5i} + \beta_1 INFit + \beta_2 MS_{it} + \beta_3 TRADE_{it} + \beta_4 POP_{it} + m_{it} \ldots\ldots (4)$$

Where:

D_{2i} =1 if observation belongs to cross-section 2 (Singapore), 0 otherwise

D_{3i} =1 if the observation belongs to cross-section 3 (Thailand), 0 otherwise

D_{4i} =1 if the observation belongs to cross-section 4 (Philippines), 0 otherwise

D_{5i} =1 if the observation belongs to cross-section 5 (Indonesia), 0 otherwise

In equation (4), the dummy variable for Malaysia is not included because the intercept term α1 already represents the intercept specific to Malaysia. The coefficients α2, α3, ..., and α8, known as differential intercept coefficients, indicate how much the intercepts of the other countries differ from the intercept of Malaysia. This is because Malaysia serves as the reference or comparison country in this model.

By omitting the dummy variable for Malaysia, the model captures the unique intercept for Malaysia through α1 and allows us to understand how the intercepts of the other countries deviate from Malaysia's intercept. The approach helps in analyzing the relative differences in the intercepts among the countries, providing valuable insights into their individual economic characteristics compared to Malaysia.

Random effects models

In the random effects model, the treatment of constants for each cross-sectional unit

(country) differs from the fixed effects model. Instead of considering the constants as fixed and unique to each country, the random effects model treats them as random parameters.

In this approach, the intercept term is not assumed to be constant across all countries. Instead, it is considered to follow a random distribution, reflecting the variations and heterogeneity among the countries. The model estimates the average intercept across all countries and then allows the individual country intercepts to deviate randomly from this average.

The random effects method captures both the overall relationship between the variables shared among all countries and the specific variations unique to each country. It considers the unobserved country-specific factors that might influence the dependent variable differently for each country. Therefore, the equation of the random-effects model is as below:

$$GDPG_{it} = \beta_{0i} + \beta_1 INF_{it} + \beta_2 MS_{it} + \beta_3 TRADE_{it} + \beta_4 POP_{it} + m_{it} \ldots\ldots (5)$$

Instead of treating β_{0i} as fixed, it is assumed to be a random variable with a mean value of β_1. Meanwhile, the intercept for an individual company can be expressed as:

$$\beta_{0i} = \beta_1 + e_i \qquad i = 1,2, \ldots, N$$

Where e_i is a random error with a mean value of zero and variance of σ^2_e. Hence,

$$GDPG_{it} = \beta_{0i} + \beta_1 INF_{it} + \beta_2 MS_{it} + \beta_3 TRADE_{it} + \beta_4 POP_{it} + m_{it} + e_i \ldots\ldots (6)$$

If we combined m_{it} and e_i into v_i, then the final equation will become the following:

$$GDPG_{it} = \beta_{0i} + \beta_1 INF_{it} + \beta_2 MS_{it} + \beta_3 TRADE_{it} + \beta_4 POP_{it} + v_i \ldots\ldots (7)$$

Where $v_i = m_{it} + e_i$

Redundant fixed effects test

The Redundant fixed effects test serves the purpose of evaluating the collective significance of the fixed effects estimates in the least square regression model. Additionally, it helps determine whether including the fixed effects is necessary for the analysis.

When conducting the Redundant fixed effects test, if the F-value turns out to be statistically significant, it indicates that the fixed effects are collectively meaningful and play a crucial role in explaining the variations in the dependent variable across the different cross-sectional units (countries).

If the F-test shows significance, it implies that the pooled regression model. It assumes a common constant for all countries and is not adequate for explaining the data. In such cases, it is recommended to prefer the fixed effects regression model, which allows for individual intercepts for each country, thereby accounting for the country-specific effects.

In summary, if the Redundant fixed effects test yields a significant F-value, it suggests that the fixed effects regression model is more appropriate and provides a better fit to the data than the pooled regression model.

Hausman test

The Hausman specification test is employed to examine the null hypothesis that the coefficients estimated by the efficient random effects estimator are equal to the ones estimated by the consistent fixed effects estimator. This test is essential in deciding whether the random effects model or the fixed effects model is more appropriate for the data.

When the P-value of the Hausman test is not significant, it suggests that there is no substantial difference between the estimates obtained from the random effects and fixed effects models. In such cases, the random effects model is considered suitable as it efficiently captures both the common effects shared among the countries and the country-specific variations.

However, if the P-value of the Hausman test turns out to be significant, it indicates that there is a significant difference between the estimates from the random effects and fixed effects models. Consequently, the null hypothesis assumes the random effects model is consistent and is rejected. In this situation, it is advisable to adopt the fixed effects model, which accounts for individual intercepts for each country and accommodates the presence of unobserved heterogeneity among the countries.

In summary, a non-significant P-value in the Hausman test favors the random effects model, while a significant P-value suggests that the fixed effects model should be preferred due to the presence of significant differences between the two estimators.

FINDINGS

Tables 3 to 7 present the regression results corresponding to the various models applied in the analysis. Each table will showcase the coefficients and statistical significance of the independent variables, allowing us to understand the relationships between the dependent variable and inflation rate (INF), percentage of money supply to GDP (MS), trade openness (TRADE), and population (POP) for the five Southeast Asian countries.

Additionally, Table 8 displays the outcomes of the Redundant fixed effects test and the Hausman test. These tests help us assess the importance of fixed effects and determine the most appropriate model for the data. The results in Table 9 will indicate whether including fixed effects is necessary or if the random effects model is preferable based on the significance levels obtained from the Hausman test.

Table 3: Result of common constant model

Variable	Coefficient	Std. Error	t-Statistic	P-value
INFL	-0.1524	0.0498	-3.0614	0.0025*
MS	-0.0173	0.0098	-1.7617	0.0797
TRADE	0.0088	0.0030	2.9286	0.0038*
POP	0.7619	0.1069	7.1246	0.0000*

*Significant at a 5% level of significance.
Source: EViews 12

Table 4: Result of fixed effects model

Variable	Coefficient	Std. Error	t-Statistic	P-value
Constant	0.1975	1.7018	0.1160	0.9077
INFL	-0.1570	0.0496	-3.1644	0.0018*
MS	-0.0565	0.0170	-3.3247	0.0011*
TRADE	0.0129	0.0095	1.3664	0.1734
POP	1.0819	0.2961	3.6535	0.0033*

*Significant at a 5% level of significance.
Source: EViews 12

Table 5: Corresponding cross-section/ country intercept value (Fixed effects)

Intercept	Country	Value
1	Malaysia	2.4469
2	Singapore	0.0088
3	Thailand	0.8057
4	Philippines	-1.8673
5	Indonesia	-1.3942

Source: EViews 12

Table 6: Result of random effects model

Variable	Coefficient	Std. Error	t-Statistic	P-value
Constant	0.5904	1.6798	0.3515	0.7256
INFL	-0.1524	0.0490	-3.1083	0.0022*
MS	-0.0174	0.0097	-1.7965	0.0740
TRADE	0.0085	0.0031	2.7317	0.0069*
POP	0.6912	0.2269	3.0460	0.0026*

*Significant at a 5% level of significance.
Source: EViews 12

Table 7: Corresponding cross-section/ country intercept value (Random effects)

Intercept	Country	Value
1	Malaysia	3.54E-12
2	Singapore	-9.38E-13
3	Thailand	5.17E-13
4	Philippines	-3.40E-12
5	Indonesia	1.88E-13

Source: EViews 12

Table 8: Result of Redundant fixed effect test and Hausman test

Redundant fixed effects test			
Effects test	Statistic	d.f.	P-value
Cross-section F	2.7182	(4,191)	0.0311
Cross-section chi-square	11.0728	4	0.0258
Hausman test			
Test summary	Chi-sq. statistic	Chi-sq. d.f.	P-value
Cross-section random	10.8728	4	0.0280

Source: EViews 12

Table 3 shows the result of the common constant model. The results indicated all the selected variables, except for money supply, show statistical significance at a 5% level. Money supply demonstrates significance at a 10% level. The findings suggest that inflation and the percentage of money supply to GDP have a negative impact on GDP growth, whereas trade openness and population have a positive impact on GDP growth.

Table 4 shows the result of the fixed effects model. The results reveal a negative relationship between inflation and the percentage of money supply to GDP concerning GDP growth. Conversely, trade openness and population exhibit a positive relationship with GDP growth. The relationships between inflation, the percentage of the money supply to GDP, and the population with GDP growth are statistically significant, while the relationship with trade openness is not deemed significant.

Furthermore, Table 6 shows the result of the random effects model. In the random effects model, inflation demonstrates a significant negative relationship with GDP growth. Although the percentage of money supply to GDP displays a similar negative relationship, it is not statistically significant. On the other hand, trade openness and population both exhibit a significant positive relationship with GDP growth.

Table 8 shows the result of the Redundant fixed effect test and Hausman test. The results from the Hausman test reveal a significant P-value (0.0280), indicating that the null hypothesis, which suggests that the random effects model is consistent, is rejected. Additionally, the Redundant fixed effects test yields a significant P-value (0.0258), lower than 0.05, which indicates that the fixed effects model is suitable.

As a result, both tests concur in favor of the fixed effects model as the most appropriate among the common constant model, fixed effects model, and random effects model. The fixed effects model is preferred for the analysis as it considers individual intercepts for each country and accounts for unobserved heterogeneity among them, providing a more precise and reliable estimation of the relationships between the variables.

In summary, both the Hausman test and the Redundant fixed effects test led to the same conclusion, indicating that the fixed effects model is the most adequate and suitable choice for this study.

CONCLUSION

The main aim of this study is to determine the most appropriate model for conducting a panel analysis of the factors influencing economic growth in Southeast Asian countries. The study uses real GDP growth as the dependent variable and considers inflation, the percentage of money supply to GDP, trade openness, and population as independent variables. The data used in the analysis covers the period from 1980 to 2019 and includes five Southeast Asian countries: Malaysia, Singapore, Thailand, Philippines, and Indonesia. The Hausman test and the Redundant fixed effects test both suggest that the fixed effects model is the most suitable for examining economic growth in these countries. The results of the fixed effect model indicate that inflation and money supply have a negative relationship with economic growth and the statistically significant at a 1% level. On the other hand, the relationship between trade openness and economic growth is positive but not significant. Moreover, there is a significant positive relationship between population and economic growth.

The study suggests that it is prudent to implement strategies that effectively manage both inflation and money supply to boost economic growth. The data indicates that maintaining stable inflation rates and carefully regulating the money supply can substantially contribute to fostering economic expansion. Besides that, there is a significant positive relationship observed between population growth and economic growth. This can be achieved by directing efforts toward enhancing education, healthcare, and employment opportunities. By transforming population growth into a resourceful human capital base, economic development can be effectively stimulated. The study has some limitations, such as the absence of complete data for Vietnam, Brunei, Cambodia, Myanmar, Laos, and Timor Leste, which prevents a comprehensive analysis of all Southeast Asian countries. To improve future research, it is recommended to expand the independent variables used in the analysis. Including additional factors such as government debt, unemployment, and human capital index can provide more insights into the drivers of economic growth in the region.

In summary, the study finds that the fixed effects model is the best fit for understanding economic growth in the mentioned Southeast Asian countries. Nevertheless, future research should aim to include more variables and expand the data coverage to gain a more comprehensive understanding of economic growth across all Southeast Asian nations.

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