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Article

Determinants of Gross National Income (GNI) in Selected ASEAN Countries

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Abstract: The ASEAN region is a center for future economic growth that holds great economic potential with a wealth of natural resources and a large population.This study aims to analyze the GNI per capita in selected ASEAN countries from 2010 to 2019. The subjects in this study were the selected ASEAN countries that belonged to the middle-income category, comprising Indonesia, Cambodia, Laos, Malaysia, Myanmar, the Philippines, Thailand, and Vietnam. The analysis employed in this study was an econometric approach, namely the panel data method, processed utilizing the EViews 7 application. While the economic freedom variable partially had a negative and significant effect on GNI per capita. Simultaneously, the foreign direct investment, index of education, and economic freedom variables significantly influenced GNI per capita. The results of this study uncovered that the coefficient of determination was 0.98. Hence, the independent variables used in this study could explain the GNI per capita variable by 98%, whereas 0.2% was explained by other variables outside the model. The novelty of this research is to explain the economic potential of ASEAN and the factors influencing it.

Keywords: Economic Growth, Leading Sector, Global Competitiveness

1. Introduction

Research on the determinants of gross national income (GNI) per capita in ASEAN countries attracts economists since it is relatively rare. Gross national income (GNI) per capita is a macroeconomic indicator that explains the total revenue in currency units from all activities of producing goods and services in a certain period. In this regard, an important aspect in analyzing the determinants of GNI per capita is the simultaneous role of the money and the goods market in forming the GNI per capita.(Jiyong Eom, 2014)

Specifically, the economic growth of the Southeast Asian region is relatively stable and indicates an increasing trend, in line with the strategic role played by ASEAN countries. The Southeast Asian region is also a future region due to its wealth of natural resources and a large population, aside from a conducive investment climate, thereby attracting investors to invest. (Autor et al., 2007). For this reason, the urgency of this study is to analyze the phenomenon of the middle-income trap in developing countries, including ASEAN countries, to provide information about the economic problems faced and how to solve them. As an illustration of the macroeconomic performance of ASEAN countries, the following are the GNI developments of ASEAN countries:

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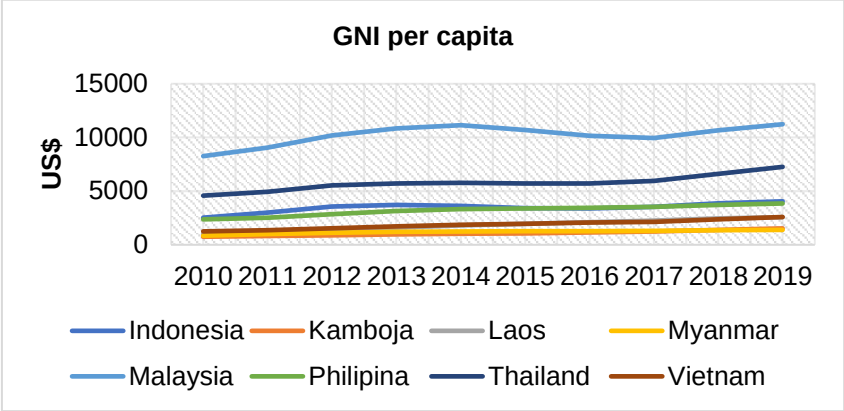

Figure 1. The GNI developments of ASEAN countries

Source: World Bank

The figure above explains the development of the GNI per capita of ASEAN countries, revealing economic stability from 2010 to 2019. The figure above also displays that eight countries were included in the category of middle-income countries in ASEAN. Among other middle-income countries, Malaysia was the only country that had managed to achieve GNI per capita above 10,000 USD. Then, it was followed by Thailand, with GNI per capita in the range of 6,000 USD. Furthermore, Indonesia followed with a GNI per capita above 4,000 USD, and the Philippines had a GNI per capita of almost 4,000 USD. After that, Laos and Vietnam had GNI per capita, which continued to increase until it reached 2,500 USD in 2019. Meanwhile, Cambodia and Myanmar were countries in ASEAN with the lowest GNI per capita, below 2,000 USD.(Epaphra, 2017)

Theoretical Framework

Studies on the determinants of gross national income (GNI) per capita are related to the issue of economic development in developing countries, and economists have researched economic development. Economic development is marked by increased production of goods and services, thereby increasing the community's economical ability to meet the needs of goods and services. In addition, in the analytical model of development theory, the neoclassical growth model is often referred to as the Solow growth model. In this case, the basic model in economic growth is the interaction of consumer behavior in maximizing satisfaction (utility) and maximizing profit by the company. The Solow growth model is formulated as follows (Lubik & Matthes, 2016):

$$Y = \int (K, L)$$

Where:

Y = Output

K = Capital/physical capital

L = Workforce

By including the assumption of utility maximization of household consumer behavior and profit maximization of firm behavior, the formulation is as follows (Romer, 1996):

$$U = \int_{t=0}^{\infty} e^{-pf} u(C(t)) \frac{L(t)}{H} dt$$

$$u\big(U(t)\big) = \frac{C(t)^{1-\emptyset}}{1-\emptyset} \quad \emptyset > 0, \qquad \rho - n - (1-\theta)\theta > 0$$

The company's behavior in determining the amount of profit-sharing in real terms is formulated as follows:

$$r(t) = f'(k(t))A = \pi r^2$$

Meanwhile, the level of real wages received by workers is formulated as follows:

$$w(t) = f\big(k(t)\big) - k(t)f'(k(t))$$

Furthermore, the utility maximization by consumer households has the following budget line formula:

$$\int_{t=0}^{\infty} e^{-R(t)} C(t) \frac{L(t)}{H} dt \leq \frac{K(0)}{H} + \int_{t=0}^{\infty} e^{-R(t)} A(t) w(t) \frac{L(t)}{H} dt$$

By combining the utility function and the budget line, the optimal point of the consumer household can be determined as follows:

$$U = \int_{t=0}^{\infty} e^{-pt} \frac{C(t)^{1-\emptyset}}{1-\emptyset} . \frac{L(t)}{H} dt$$

$$= \int_{t=0}^{\infty} e^{-pt} \left[A(0)^{1-\emptyset} e^{(1-\emptyset)gt} \frac{c(t)^{1-\emptyset}}{1-\emptyset} \right] \frac{L(0)e^{nt}}{H} dt$$

$$= A(0)^{1-\emptyset} \frac{L(0)}{H} \int_{t=0}^{\infty} e^{-pt} e^{(1-\emptyset)gt} e^{nt} \frac{c(t)^{1-\emptyset}}{1-\emptyset} dt$$

$$= B \int_{t=0}^{\infty} e^{-pt} \frac{c(t)^{1-\emptyset}}{1-\emptyset} dt, \qquad B \equiv A(0)^{1-\emptyset} \frac{L(0)}{H} \beta \equiv \rho - n - (1-\theta)g$$

Illustration in a curve depicting economic growth is expressed through a shift in the production possibilities frontier (PPF) as follows:

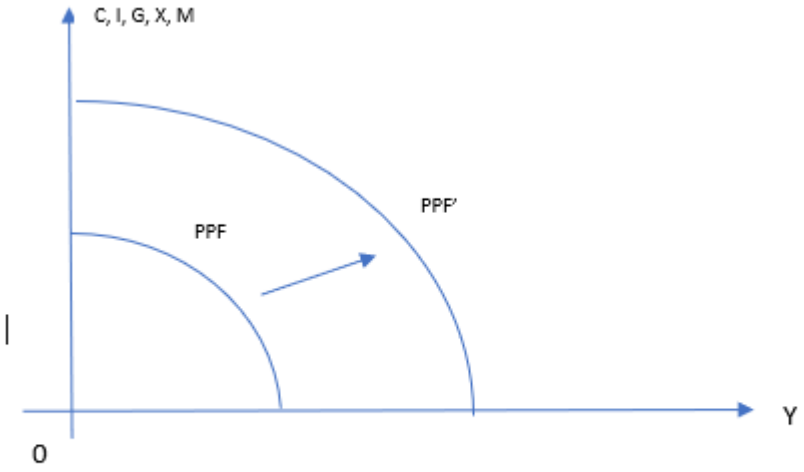

Figure 2. Description of economic growth

Source: Michael P. Todaro, *Economic Development* (2000)

Economic development is distinguished by its understanding of economic growth. Economic growth requires an increase in per capita income, while economic development is not only marked by an increase in per capita income but is also followed by changes in the quality of people's lives and government systems. Hence, economic development has a broader meaning than economic growth.(Pimentel & Martin, 2019). Moreover, the study of economic development is related to the concept of realizing sustainable development goals, which not only concern material economic aspects but also environmental, social, and cultural aspects that ensure the sustainable development process in the long term. In addition, economic development requires economic openness and freedom to provide wider opportunities for economic actors to conduct economic transactions with other parties from abroad, thereby increasing economic efficiency and expanding market opportunities. (Zhang, 2017)

Meanwhile, economic growth is also influenced by the quality of human resources as the driving force of the economy, where the main factor for producing a quality

workforce is the development of the education sector. In this case, the role of capital is significant in encouraging economic growth as a factor of production that increases economic capacity through investment activities and product innovation. The number and availability of investment variables will then determine the quality and quantity of national production.(Redding, 2009)

2. Materials and Methods

Research on the determinants of gross national income per capita in selected ASEAN countries applied a panel data analysis model with the following formula:

$$Y = \alpha + b1X1it + b2X2it + b3X3it + e$$

Description:

Y = Gross national income (GNI) per capita
α = Constant
X1 = Foreign direct investment (FDI)
X2 = Economic freedom index
X3 = Education index
e = Error term
t = Time
i = Country

The data in this study were secondary from World Bank publications from 2011 to 2019, covering eight ASEAN countries: Indonesia, Malaysia, Singapore, Thailand, Vietnam, Philippines, Laos, and Cambodia. Then, the Chow and Hausman tests were conducted to determine the analytical method in panel data research, whether the common effect model (CEM), fixed effect model (FEM), or random effect model (REM). First, the Chow test determined whether the panel data regression analysis model was the common effect model (CEM) or the fixed effect model (FEM). Meanwhile, the Hausman test determined whether the panel data regression analysis model was a fixed-effect model (FEM) or a random effect model (REM).

In addition to the t-test and F-test, the next statistical tests were the multicollinearity and heteroscedasticity tests to obtain estimation results on research variables that met the classical assumptions. The classical assumption test determined whether problems related to heteroscedasticity and multicollinearity exist.

3. Results and Discussion

This research on the determinants of gross national income (GNI) per capita was quantitative to explore the factors influencing gross national income per capita through an analysis of the panel data equation model in eight selected ASEAN countries. The dependent variable in this study was gross national income (GNI) per capita, whereas the independent variables were a foreign direct investment (FDI), economic freedom (EF) and education index (EI). (Duranton & Overman, 2005). The steps taken were conducting the Chow test to determine whether the analysis model applied the fixed effect model or the common effect model. Based on the Chow test results, the probability value was $0.00 < 0.05$, meaning that the analysis model applied was the fixed effect model. In the next stage, the Hausman test was performed to determine whether the analysis model applied the fixed or random-effect model. Based on the Hausman test results, the probability value was $0.002 < 0.05$, denoting that the correct specification model was the fixed effect model. Furthermore, the estimation results of the panel data equation model for the determinants of gross national income (GNI) per capita in selected ASEAN countries are as follows:

Table 1
Results of Panel Data Analysis Model Estimation

Dependent Variable: GNI per capita	Model		
	Fixed Effect	Random Effect	Common Effect
Constant (C)	14.49063	12.75520	-0.905907
Standard error	1.185303	1.204149	1.802912
Probability	0.0000	0.0000	0.6168
t-statistic	12.22526	10.59271	-0.502469
FDI (X1)	0.028252	0.022628	-0.064657
Standard error	0.008908	0.009317	0.013050
Probability	0.0023	0.0175	0.0000
t-statistic	3.171660	2.428721	-4.954608
EF (X2)	-0.844574	-0.515179	2.453055
Standard error	0.234171	0.250087	0.408260
Probability	0.0006	0.0428	0.0000
t-statistic	-3.606658	-2.059997	6.008553
EI (X3)	5.838286	5.082847	1.451422
Standard error	0.505061	0.438735	0.382400
Probability	0.0000	0.0000	0.0003
t-statistic	11.55958	11.58524	3.795557
R^2	0.989022	0.721035	0.833981
F-Statistic	621.6565	65.47852	127.2594
Prob(F-Stat)	0.000000	0.000000	0.000000
Durbin-Watson Stat	0.804206	0.439469	0.202291

Source: Secondary data

The estimation results from the fixed effect analysis model showed that all independent variables, namely foreign direct investment (FDI), economic freedom (EF), and education index (EI), had probability values of < 0.00 < 0.05. Thus, these independent variables significantly affected gross national income (GNI) per capita individually. (Arzaghi & Henderson, 2008). Then, the regression coefficient value of the foreign direct investment (FDI) variable was 0.028, with a probability value of 0.002 <0.05. It indicates that changes in the FDI value had a positive and significant effect on changes in GNI per capita. In other words, if FDI increases by 1 point, it will cause an increase in GNI per capita of 0.028%. This empirical finding is consistent with Harod-Domar's theory about the importance of the role of capital from the results of public savings to achieve high economic growth. This empirical finding also aligns with the results of previous studies, which explained the role of capital in promoting economic growth in developing countries.

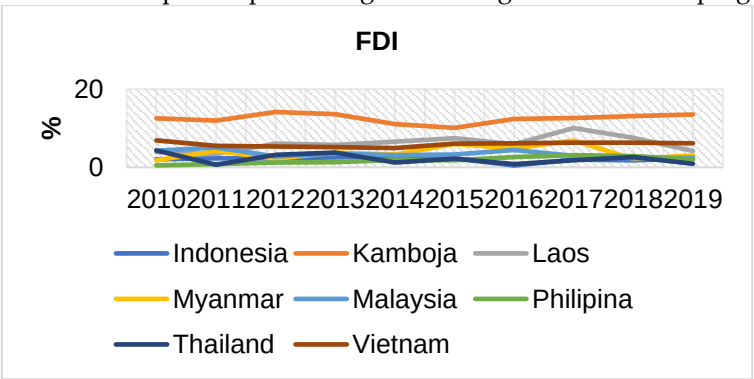

Figure 3. FDI values in eight selected ASEAN countries
Source: World Bank

The estimation results of the panel data equation model revealed that the economic freedom (EF) regression coefficient was -0.844, with a probability value of 0.0006 <0.05. It signifies that changes in economic freedom (EF) had a negative and significant effect on changes in GNI per capita. Empirical findings also explain that an increase in the economic freedom (EF) index by 1 point will reduce GNI per capita by 0.844 %. This phenomenon indicates that economic openness for ASEAN countries is actually a threat to their economic growth. This condition proves that several economic commodities in ASEAN countries have not been able to compete in the global market and still need protection from the government.(Diamond & Simon, 1990)

The estimation results from the panel data equation model also disclosed the education index (EI) regression coefficient value of 5.838, with a probability value of 0.00 <0.05. It denotes that an increase in the value of the education index (EI) by 1 point will cause an increase in GNI per capita of 5.838%. This empirical finding also confirms the importance of education in encouraging the improvement of the quality human resources (HR) as the main factor driving economic growth in all economic sectors. This result corroborates the economic growth theory of Arthur Lewis and Joseph Schumpeter regarding the role of quality human resources in increasing economic productivity and innovation as a driver of economic growth. This empirical finding also verifies that the issue of economic development in developing countries, including in ASEAN, concerns the development of the quality of human resources through the development of a quality education sector. (Duranton & Overman, 2005)

4. Conclusion

Research on the determinants of gross national income (GNI) per capita in selected ASEAN countries showed that the foreign direct investment (FDI), economic freedom (EF), and education index (EI) variables had a significant effect on changes in gross national income (GNI) per capita in ASEAN countries. The results of this study imply that the economic potential of ASEAN countries is quite large and requires large capital to mobilize its economic resources. Empirical findings also suggest that the economies of ASEAN countries are small countries in the context of the international economy, so they are very sensitive in responding to changes in the global economy. To anticipate global economic turmoil with the potential to damage the foundations of the economy, there needs to be a synergistic collaboration between the government and business actors to increase economic efficiency and business productivity. It is also necessary to formulate government intervention policies to protect business actors concerning the broader community's interests. In addition, this research implies the importance of developing the education sector as the basis for producing quality human resources as a driving force for economic development.

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