DIPONEGORO JOURNAL OF ECONOMICS *Vol. 14, No. 3 (2025) 141-150*
https://ejournal3.undip.ac.id/index.php/jme *e-ISSN 2963-1688, p-ISSN 2337-3814*

Financial Development, Human Capital, and Investment in 7 ASEAN Countries: A Triangular Analysis of Economic Growth

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Received: 1st July 2025; Last Revised: 29th September 2025; Accepted: 23rd December 2025
Available Online: 31st December 2025; Published Regularly: September 2025

Abstract

Economic growth is the main goal of all countries in the world, both developed and developing countries. Initially, growth theory only emphasized labor, capital, and natural resources, yet it often overlooked the contribution of financial systems. The financial sector will trigger economic growth through its intermediary function. The objective of this study is to see the influence of financial sector development, human capital, and investment in boosting economic growth in 7 ASEAN countries. This study employs secondary data, including gross domestic product (GDP), the ratio of broad money to GDP, the ratio of domestic credit to GDP, gross fixed capital formation, and the education index, utilizing a fixed effects model with the generalized least squares (GLS) approach as the analytical tool to estimate the regression model. The results of this study are that the ratio of broad money to GDP has a negative effect on economic growth in 7 ASEAN countries. Meanwhile, the ratio of credit to GDP, gross fixed capital formation, and the education index have a positive effect on economic growth in 7 ASEAN countries. ***We therefore contribute to the literature*** *by adding the theory of economic growth, which subsequently impacts the real sector.*

Keywords: Financial Sector Development, Human Capital, Investment, and Economic Growth

JEL Classifications: O16, O47, and I25

https://doi.org/10.14710/djoe.52526

Introduction

Economic growth has consistently been a primary goal for all nations, both developing and developed countries. Economic growth is an improvement in the economic conditions of a country that occurs sustainably over time. According to Todaro & Smith (2015), economic growth is one of the key indicators of a country's development progress.

Initially, the growth theories only emphasize the roles of labor, capital, and natural resources, yet often overlook the contribution of financial systems. According to Mishkin (2015), a healthy and dynamic economy requires a financial system that can efficiently channel funds from savers to those with productive investment opportunities. Financial development refers to the process of improving the efficiency and effectiveness of financial markets and institutions. The development of financing within the ASEAN economic integration is essential for increasing financial inclusion and enabling investment because it enhances market efficiency, reduces transaction costs, which supports sustainable economic growth across member countries by mobilizing and allocating resources more effectively.

According to Levine (2005), there are five main channels related to the relationship between financial sector development and economic growth. First, the development of the financial sector can reduce information costs, so that the financial sector can allocate savings efficiently from savers to households and companies with viable investment prospects. Second, the development of the financial sector will improve corporate governance, thereby encouraging investment productivity. Third, the financial sector will increase transparency, increase hedging against further risk, and encourage asset diversifications and this will encourage long term investment. Fourth, the development of the financial sector will encourage capital accumulation via savings mobilization. Fifth, the development of the financial sector facilitates the exchange of goods and services and increases specialization, thus encouraging increased labor productivity and output produced.

The development of the financial sector can be shown by financial deepening. Financial deepening can be seen as one form of improvement and also expansion of the financial sector by increasing liquidity, efficiency, and volume of financial institutions and markets. If a country has a deep financial sector, it means that there is diversification of financial resources and expansion of access to banking and other financial services (Dabla-Norris et al., 2012).

In various empirical studies, the ratio of the amount of money supply is used by King & Levine (1993), Goldsmith (1969) and other economists to measure financial deepening. This ratio shows the expansion in other financial intermediation sectors because there is a rapid accumulation of various financial assets, especially savings. The development of the broad money/GDP ratio in seven ASEAN countries is shown in Figure 1.

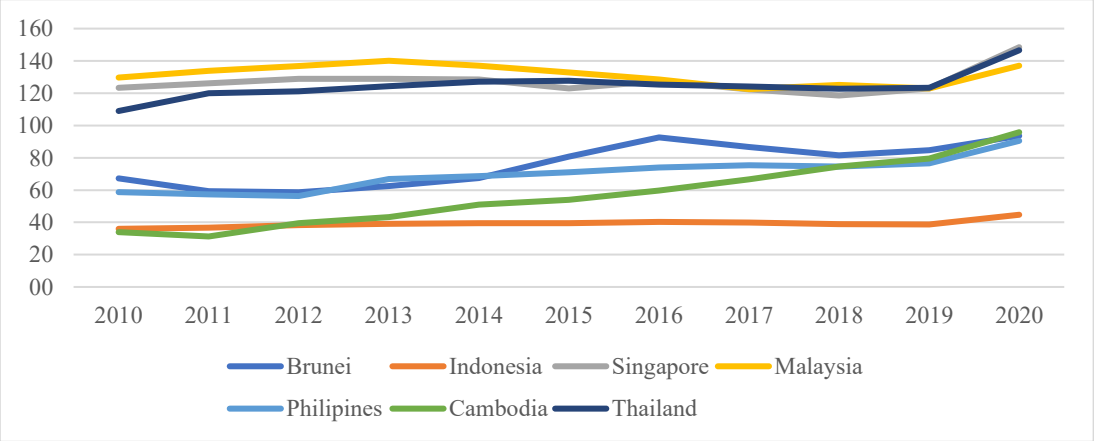

Figure 1. Broad Money (%GDP) in Seven ASEAN Countries
Source: WorldBank

Figure 1 reflects the ratio of board money to GDP in seven ASEAN countries from 2010 to 2020. This ratio indicates the amount of money in circulation relative to GDP. In the seven selected ASEAN countries, the broad money-to-GDP ratio exhibited a large growth in 2020. Singapore experienced the most significant gain, escalating from 123.03 percent in 2019 to 148.48 percent in 2020. During the period from 2010 to 2020, Indonesia exhibited the lowest broad money to GDP ratio among the other seven ASEAN nations.

According to Botev et al (2019), development of the financial sector positively influences economic growth by enhancing savings mobilization, improving resource allocation efficiency, and fostering technological innovation. The financial sector will drive economic growth through its intermediary function by collecting funds from parties with excess funds and distributing these funds to parties in need through various financial instruments (Leitao, 2010).

The efficiency of the intermediation function is one measure of financial development. The domestic credit to private sector ratio can be used to evaluate this. The percentage of credit given by financial institutions to the private sector in relation to GDP is shown by the domestic credit to private sector–to-GDP ratio. This measure shows how much money is given to the private sector in an economy. A deeper and more sophisticated financial system is indicated by a greater domestic credit to private sector ratio, which implies that financial institutions are able to provide enough funding to support private sector operations.

Theoretically, there are two hypotheses that explain the direction of the relationship between the financial sector and economic growth, namely the supply-leading theory and demand-following theory. The supply leading hypothesis states that it is the financial sector that drives economic growth, meanwhile demand following hypothesis states that economic growth drives the development of the financial sector (Patrick, 1966). However, these two different hypotheses yield the same result: a positive relationship between the financial sector and the growth of the economy.

The role of the financial sector in the economy can be seen through the lens of the Harrod-Domar theory about capital formation. It is known that capital formation is equivalent to savings. This theory explains that the higher the level of savings and the more they are invested, the higher the output produced, which can encourage economic growth. Investment is an activity of investing capital in various economic activities that aim to generate long-term profits. Investment is one component of national income from the expenditure side that is important in the economy. Furthermore, in endogenous growth theory, Romer stated that capital accumulation plays an important role in economic growth in a broader sense, encompassing human capital elements. According to a publication by the Organization for Economic Co-operation and Development (OECD), human capital is knowledge, skills, competencies, and attributes contained in individuals that facilitate the creation of personal, social, and economic well-being.

Theoretical Framework

The Keynesian Economic Theory

The Keynesian Economic Theory acknowledges that government policy and expenditure are essential for the advancement of human capital via education and training. Investments in education enhance labor productivity and skills, hence

increasing the economy's potential output and fostering long-term growth. Government investment in education corresponds with Keynesian theory, which posits that public expenditure can stimulate demand; by improving human capital, such investment creates a more efficient workforce that draws in investment and innovation, thus promoting sustainable growth.

The Harrod Domar Theory

Harrod Domar's growth theory is an amalgamation of Keynes' theory regarding the of capital formation in economic activity. In this theory, capital formation is not seen as an expenditure that will increase the ability of an economy to produce goods and services, but will also increase the effective demand of society (Todaro, M P & Smith, 2015). Capital formation is primarily influenced by the accumulation of savings, where capital formation is equivalent to the savings rate (S=I). This theory states that the output growth rate $(\Delta Y/Y)$ is jointly influenced by the national savings ratio (s) and the national capital-output ratio (c), as stated in the following equation:

$$\frac{\Delta Y}{\mathrm{Y}} = \frac{S}{C} \quad (1)$$

The equation shows that the output growth rate is directly proportional to the ratio of saving, the higher the rate of saving and the amount being invested, the higher the level of output produced.

The Solow-Swan Growth Theory

The growth model proposed by Solow describes an economy in a country where output growth is the result of two types of inputs, namely capital (K) and labor (L), so that the production function is obtained as follows:

$$Y = f\ (K, L) \quad (2)$$

By incorporating technology into the production function, the equation becomes:

$$Y = F[(K, L)E] \quad (3)$$

Where E is a new variable called labor and capital efficiency, since there is technology used in the production process. In labor efficiency, technology can be in the form of public knowledge regarding methods that can be used in the production process. The efficiency of the workforce itself will be achieved if there are improvements in the fields of education, health, and also the skills. This condition will also increase the level of productivity produced by the workforce itself. For the capital efficiency, technology can be a form of machines or tools used during the production process (Mankiw, 2006).

The Endogenous Theory

The endogenous growth model presents a theoretical framework that is used to analyze the process of economic growth, which is influenced by factors originating from the economic system itself. Technological progress is an endogenous trait, where growth is part of the decision of economic actors to invest in science (knowledge spillover). In addition, the notion of capital is not only physical capital, but also includes human capital (Todaro, M P & Smith, 2015).

Financial System

The financial system is a system that consist of a collection of institution, regulation and markets that interact with each other to mobilize funds and provide facilities, including payment systems that are used to finance commercial activities. The financial system consists of two components, namely financial markets and financial intermediary institutions. Financial markets and financial intermediary institutions have the function of ensuring that they channel funds from lenders who have excess funds to borrowers who need funds (Mishkin, 2015).

Financial intermediaries themselves have a very important role in the economy because financial intermediaries provide liquidity services, promote risk sharing, and also solve information problems. In addition, financial intermediaries also have a role in increasing economic efficiency because they help financial markets by linking funds from lender-savers to those with productive investment opportunities (Mishkin, 2015). A well-functioning financial system is a major factor in promoting economic growth.

Research Method

This study uses panel data that combines cross-sectional data from 7 selected ASEAN member countries with time-series data from 2010 to 2020. The types of data used in this study are secondary data, data obtained from various sources. The dependent variable utilized to assess economic growth is Gross Domestic Product (GDP) in US dollars, sourced from the World Bank. The independent variables utilized comprise the ratio of broad money supply to GDP and the ratio of domestic credit to the private sector, both serving as indicators of financial deepening collected from the World Bank website, gross fixed capital formation representing investment, also obtained from the World Bank, and the education index to represent human capital obtained from the United Nations Development Index. The empirical model used in this study is:

$$logGDP_{it} = \beta_0 + \beta_1 logM2_{it} + \beta_2 logLoan_{it} + \beta_{it} logINV_{it} + \beta_{it} logEdu_{it} + \varepsilon_{it} \quad (4)$$

where:

LOGGDP	= Gross Domestic Product
LOGM2	= The ratio of broad money per GDP
LOGLOAN	= The ratio of domestic credit to the private sector per GDP
LOGINV	= Gross fixed capital formation
LOGEDU	= Education index
β_0	= Intercept
i	= 1,2,3, …, 7 (cross-section data of ASEAN countries)
t	= 1,2,3, …, 11 (time series data from 2010 until 2020)
ε	= Error term

The data analysis technique used in this study is balanced panel data analysis using the fixed effect model approach, obtained based on the Chow test and the Hausman test. The fixed-effect model assumes that each individual or cross-section has a different intercept, but the coefficients of the variables are not different for the time series and cross sections. Furthermore, the regression model in this study was

tested using classical assumptions in order to obtain BLUE (Best, Linear, Unbiased, and Estimator) estimation results. The results of the classical assumption test in this study indicate that the normality test and autocorrelation test are not met.

To fix the problem of heteroscedasticity and autocorrelation problems, namely by the weighting method, also known as Generalized Least Squares (GLS). This method is OLS on transformed variables that meet the standard assumptions of least squares. So that the GLS method produces an estimator that is BLUE and meets the assumptions of the classical model (Gujarati & Porter, 2009).

Result and Discussion

The outcomes of panel data estimation employing a fixed effect model via the GLS technique for each independent variable—specifically, the ratio of broad money to GDP, the ratio of credit to GDP, gross fixed capital formation, and the education index—indicate the following results about economic growth:

Table 1. Panel Regression Result

Variable	Coefficient	t-statistic	Prob	Information
C	20.10068	51.58400	0.0000	Sig. at α = 5%
LOGM	-0.425614	-10.31093	0.0000	Sig. at α = 5%
LOGLOAN	0.484068	15.60001	0.0000	Sig. at α = 5%
LOGINV	0.240885	11.86422	0.0000	Sig. at α = 5%
LOGEDU	1.474120	14.77634	0.0000	Sig. at α = 5%
R – Squared		0.999612		
F-Statistic		17012.66		
Prob F. Statistic		0.000000		Sig. at α = 5%

The coefficient of determination (R^2) is 0.999, as indicated by the estimation results in Table 1. This signifies that 99.9 percent of economic growth in the seven chosen ASEAN nations is explicable by the independent variables in the model, whereas 0.1 percent is attributable to external variables not included in the model. The coefficient of determination indicates that the research model is effective for application.

The statistical F-test was conducted to determine whether all independent variables used have a simultaneous influence on the dependent variable. This study uses the number of observations (n) as many as 77 and the number of parameters (k) as many as 4, with this, the F table value obtained is 2.730. Based on the table above, the regression results show that the F-Calculation is greater than the F-table (17012.66 > 2.730) with a probability of the F-statistic being smaller than the significance level (α = 0.05). This means that H_0 is rejected and H_1 is accepted, which means that the independent variables simultaneously affect the dependent variable significantly.

The t-statistic test was conducted with the aim of determining the magnitude of the influence of the independent variable on the dependent variable. The regression model in this study uses a confidence level of 95% or α = 5% with a degree of freedom value of 72 *(n-k-i*), so the t table value is 1.666. Table 1 shows that the ratio of broad money per GDP (LOGM) the variable has a significant influence but has not been able to increase economic growth because the t-statistic value is smaller when compared to the t-table (-10.31093 < 1.666), the ratio of domestic credit per GDP (LOGLOAN) has a positive and significant effect on economic growth since the t-statistic is higher than

the t-table (15.60001 > 1.666), the gross fixed capital formation (LOGINV) has a positive and significant effect on economic growth since the t-statistic is higher than t-table (11.86422 > 1.666), and the education index has a positive and significant effect on economic growth since the t-statistic is higher than the t-table (14.77634 > 1.666).

The Effect of Broad Money/GDP Ratio on Economic Growth

Fixed effect regression model with generalized least squares explains that the broad money per GDP ratio variable has a negative relationship with economic growth in seven ASEAN countries. The coefficient value of the domestic credit to private sector variable is -0.425614, which means that every 1 percent increase in the broad money per GDP ratio will cause a decrease in economic growth of 0.425614 percent, assuming other variables remain constant (ceteris paribus).

The money Supply/GDP Ratio is one indicator of the depth of the financial sector. The deepening of the financial sector reflects the level of development and depth of the sector that can effectively carry out the intermediation function. The deeper the financial sector, the greater its capacity to collect and distribute funds. Based on the estimation results, this study found a negative relationship between the broad money/GDP ratio and economic growth. The negative influence between the broad money/GDP ratio and economic growth is thought to occur because the financial system in these countries is not functioning properly or is still relatively shallow, so that it cannot allocate capital efficiently (Cheng et al., 2021). This situation is exacerbated by the zero lower bound, which limits the effectiveness of monetary policy in stimulating economic activity.

The Effect of the Domestic Credit to Private Ratio on Economic Growth

Fixed effect regression model with generalized least squares explains that the domestic credit to private sector per GDP ratio variable has a positive relationship with economic growth in seven ASEAN countries. The coefficient value of the domestic credit to private sector variable is 0.484, which means that every 1 percent increase in domestic credit to the private sector will cause an increase in economic growth of 0.484 percent, assuming other variables remain constant (ceteris paribus).

The results of this study also support previous studies on the positive impact of credit distribution on economic growth. Ajogbeje (2016) stated that the credit distributed is positive and significant to economic growth because more credit will be allocated to the private sector, thereby increasing investment capacity in the real sector and enhancing economic growth. Credit is considered the most important channel of the financial intermediation function that can mobilize investment. The Supply-leading hypothesis states that the financial sector is the driver of economic growth, as evidenced by the regression results using the domestic credit to private ratio variable.

The Effect of Gross Fixed Capital Formation on Economic Growth

It is known that the fixed effect regression model with generalized least squares explains that the gross fixed capital formation variable has a significantly positive relationship with economic growth in seven ASEAN countries. The coefficient value of the domestic credit to private sector variable is 0.240, which means that every 1%

increase in gross fixed capital formation will cause an increase in economic growth of 0.240 percent, assuming other variables remain constant (ceteris paribus).

The results of this study indicate that increased economic growth can occur if domestic investment, both private and government, increases, where domestic investment is part of the Gross Fixed Capital Formation (GFCF) and a component of GDP from the expenditure side. Capital formation is an expenditure that increases effective public demand and the economy's ability to produce goods and services (Arsyad, 2017). The results of this study are by Harrod-Domar's Theory of Economic Growth, which states that one of the drivers of economic growth is capital formation, where the amount of capital accumulation is equal to the accumulation of savings. If the savings rate is high, the economy will have a large capital stock and a high level of output.

The Effect of Education Index on Economic Growth

It is known that the fixed effect regression model with generalized least squares explains that the education index variable has a significantly positive relationship with economic growth in seven ASEAN countries. The coefficient value of the education index variable is 1.474, which means that every percent increase in gross fixed capital formation will cause an increase in economic growth of 1.474 percent, assuming other variables remain constant (ceteris paribus).

The results of this study are in accordance with the endogenous growth theory, where increased economic growth can occur if human capital increases. The results of this study are in line with the Theory of endogenous growth, which posits that increased economic growth can occur when human capital increases. Human capital will encourage the accumulation of other factors needed for economic growth, especially physical capital. This is because human capital is closely related to the knowledge and skills possessed by each individual or workforce obtained from education, training and experience. This increase in knowledge and skills will encourage the level of labor productivity in the production of goods and services. The results of this study are in accordance with research conducted by Zhang & Wang (2021) which states that increasing capital accumulation will directly increase capital accumulation through increasing labor productivity. This increase in productivity can be shown through the increase in national output. The increase in total output will ultimately drive the rate of economic growth.

Conclusion

This study aims to determine the influence of financial sector development, gross fixed capital formation, and human capital index in selected ASEAN countries. The growth of financial sector indicators is represented by using the Broad Money-to-GDP ratio and Gross Domestic Credit to Private Sectors. Broad money is an indicator of financial deepening that measures the financial system's ability to mobilize savings and can also be referred to as an indicator of economic liquidity, encouraging economic growth. This study employs the Fixed Effects Model (FEM) estimation technique with the Generalized Least Squares (GLS) method to examine the influence of the financial sector through its financial intermediation function and the theories of economic growth, including Harrod-Domar, Solow-Swan, and endogenous growth, which will later have an impact on the real sector.

This study found a negative relationship between the ratio of broad money per GDP and economic growth. The Money Supply/GDP Ratio is one indicator of the depth of the financial sector. The deepening of the financial sector reflects the level of development and depth of the sector that can effectively carry out the intermediation function. The negative influence between the broad money/GDP ratio and economic growth is thought to occur because the financial system in these countries is not functioning properly or is still relatively shallow, so that it cannot allocate capital efficiently. Another finding in this study is that increasing credit provided by financial institutions to the private sector will increase economic growth. Credit is considered the most important channel of the financial intermediation function that can mobilize investment. Supply-leading hypothesis states that the financial sector is the driver of economic growth, as evidenced by the regression results using the domestic credit to private ratio variable.

Another finding from this research is that Gross Fixed Capital Formation has a significantly positive relationship with economic growth in seven ASEAN countries. Domestic investment is part of the Gross Fixed Capital Formation (GFCF) and a component of GDP from the expenditure side. Increasing human capital drives economic growth through the accumulation of other factors, especially physical capital, because human capital is closely related to the knowledge and skills possessed by each individual to increase productivity in the production process until it can ultimately produce high output.

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