

Simultaneous Analysis of Portfolio Investment and the Money Supply in Asean Upper Middle Income Countries

Fitri Akhyuni^{1*}, Hasdi Aimon²

^{1,2} Universitas Negeri Padang

*¹ fitriakhyunihas89@gmail.com

² s3dkpl@gmail.com

ABSTRACT

The research aims to analyze and determine (1) the influence of money supply, stock prices, economic growth and inflation on portfolio investment in Upper Middle Income countries in ASEAN. (2) the effect of portfolio investment, inflation, interest rates and government spending on the money supply of Upper Middle Income countries in ASEAN. The population in this study is Indonesia, Malaysia and Thailand which are members of the Upper Middle Income ASEAN (Association of South East Asian Nations) group of countries. This study uses panel data for the period 2005 - 2019. The analysis technique used is the Two Stage Least Square (2SLS) method using the E-Views 9 tool. The results show that (1) The money supply and portfolio investment have a significant and negative simultaneous relationship, stock prices have a significant positive relationship with portfolio investment, economic growth has a significant negative relationship with portfolio investment, while inflation has a significant positive relationship with portfolio investment (2) There is a simultaneous negative and significant relationship between portfolio investment and the money supply, inflation has a significant positive relationship with the money supply, while interest rates and government spending have a negative and insignificant relationship with the money supply.

Keywords: *Portfolio Investment, Money Supply, Simultaneous Equations, TSLS.*

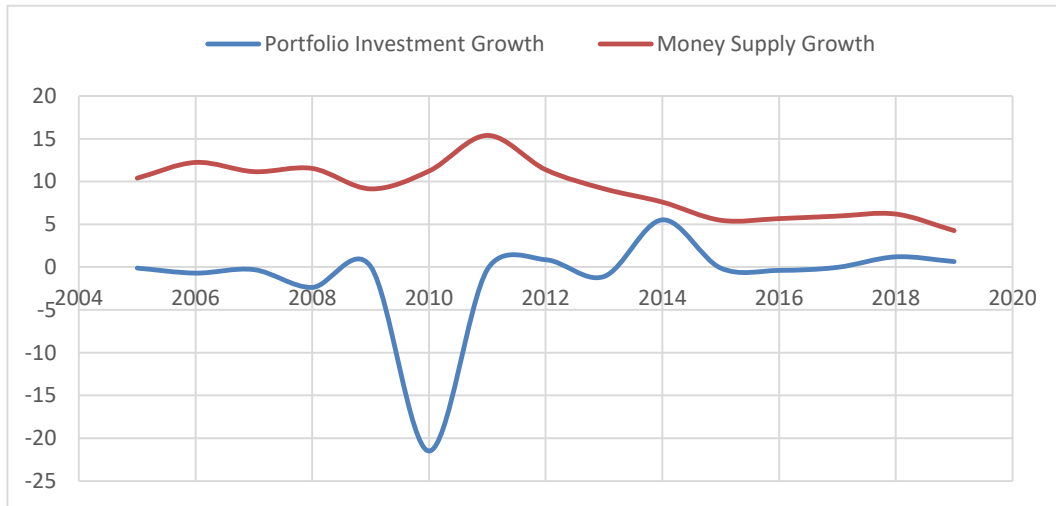
1. INTRODUCTION

In the current era of global business globalization, every country adopts an open economic system by cooperating to carry out international trade activities. Some goods and services are sold on the domestic market and some are sold on foreign markets because each country integrates with each other in meeting the needs of its people. In this era, the international economy continues to develop. Its development provides the fact that the changes are extremely fast leading to a globalizing economic system.

Asean is a form of association formed by countries in facing the globalization of the world economy. This association aims to form an economic strength to facilitate the movement of economic activities in the face of an ever-globalizing economy.

Collecting investment is a state effort to increase development in the country. One form of investment is

portfolio investment (Krugman&Obsfeld, 2011). According to Murdiah&Bowo (2020) there is an interrelated relationship between investment and money supply (money supply). The increase in investment in this research is that portfolio investment will also be able to increase the money supply in a country. Increased investment will cause people's income to increase so that public consumption will also increase. In the end, this condition causes the money supply in the community to also increase. The occurrence of excess money supply encourages inflation so that it interferes with economic development. Then the Central Bank of a country will certainly take a policy of reducing interest rates. This condition will encourage investors to invest in the country.



Source: World Bank, 2020

Figure 1. The Relationship between Money Supply and Portfolio Investment Upper Middle Income Countries in ASEAN 2005 – 2019

Based on figure 1, it is known that the amount of money in circulation and portfolio investment in the Upper Middle Income countries in Asean fluctuates in value every year. In 2008, the money supply increased, but in fact portfolio investment growth declined that year. The same fact was shown in 2014, where when the money supply decreased considerably from the previous year, but the portfolio investment actually increased. This shows a difference with the theory presented by Murdiah & Bowo (2020), where in theory, when the money supply increases, investment will also increase and vice versa.

Apart from having a causal relationship with portfolio investment, the money supply is also influenced by inflation. The higher the price level the greater the quantity of money demanded. Inflation is a form of economic problem that is often experienced by almost all countries, especially developing countries (He, 2017; Nadig & Viswanathan, 2019; Sultana, 2019). Interest rates can be used by the government to reduce the rate of money circulation in the community, meaning that if the interest rate is high, people are more likely to use their money to save so that the amount of money in the hands of the community decreases (He, 2017; Urbanovsky, 2017).

After the introduction part, the second part of this research will discuss the methodology, the third part will analyze the results and discussion and the fourth part will conclude.

2. METHOD

This research was conducted in 3 Upper Middle Income countries in Asean with a span of 15 years from 2005 - 2019. This study uses a simultaneous equation

model where there are two equations in this model, namely:

$$Y1_{it} = \alpha_1 + \beta_1 X1_{it} + \beta_2 X2_{it} + \beta_3 X3_{it} + e \dots\dots\dots (1)$$

$$Y2_{it} = \alpha_1 + \beta_3 X3_{it} + \beta_4 X4_{it} + \beta_5 X5_{it} + e \dots\dots\dots (2)$$

In estimating the simultaneous equation, sufficient and necessary conditions are needed, namely through the model identification test using the condition order test and the condition rank test. View identification results of the simultaneous equation model, this model will be estimated using the Two Stage Least Square method (Gujarati, 2012).

3. RESULT AND DISCUSSION

Based on table 1, estimated model for the Portfolio Investment equation in ASEAN Upper Middle Income countries can be written as follows:

$$Y1 (INV Portofolio) = 0.681742 - 0.0053 Y2 (M2) + 0.0029 LOGX1 (HS) - 0.0245 LOGX2 (GDP) + 0.0042 X3 (INF).$$

Statistically, the model used is fit and valid. Indicated by the F-statistic probability value of 0.000 at a significance level of 5 percent. This means that simultaneously, the exogenous variable has no significant effect on the rejected endogenous variable and *H1* at least there is one exogenous variable that has an accepted

endogenous variable. In other words, the four exogenous variables used in this study, namely the money supply, stock prices, economic growth and inflation collectively affect portfolio investment in ASEAN Upper Middle Income countries. Here the authors present the results of the estimation of the first equation, namely the portfolio investment equation. The R-squared value obtained in the model is 0.4762, which means that all exogenous variables in this study are able to explain the proportion of diversity (variance) of the endogenous variables by 47.62 percent, while the remaining 52.38 percent is explained by other variables outside the model. If viewed partially, the exogenous variables used in this study have a significant influence on portfolio investment in ASEAN upper middle income countries.

The parameter estimation results in the model shown in table 1 show that the money supply variable (Y2) has a significant and negative effect on portfolio investment growth in ASEAN upper middle income countries at a significance level of 5 percent. This means that every one percent increase in the money supply causes a decrease in the growth of portfolio investment flows by -0.0053 units during *ceteris paribus* conditions. This means, the more money that is widely circulated in the community of a country, the less opportunities to increase the number of portfolio investment flows that enter the country. The parameter estimation results in the model shown in table 1 show that the stock price variable (X1) has a significant and positive influence on the growth of portfolio investment in ASEAN upper middle income countries at a significance level of 5 percent. That is, every one percent increase in the stock price of a country causes an increase in the growth of portfolio investment flows by 0.0029 units during *ceteris paribus* conditions. This means, the higher the stock price in a country will increase the number of portfolio investment flows that enter the country.

The parameter estimation results in the model shown in table 1 show that the variable economic growth or GDP (X2) has a significant and negative influence on the growth of portfolio investment in ASEAN upper middle income countries at a significance level of 5 percent. That is, every one percent increase in a country's economic growth has the effect of decreasing the growth of portfolio investment flows by -0.0245 units in *ceteris paribus* conditions in that country. This means, the higher the economic growth of a country, the lower the number of portfolio investment flows that enter the country. The parameter estimation results in the model shown in table 1 show that the inflation variable (X3) has a significant influence and shows a positive relationship to portfolio investment growth in ASEAN upper middle income countries at a significance level of 5 percent. That is, every one percent increase in a country's inflation rate has an effect on the growth of portfolio investment flows by 0.0042 in *ceteris paribus* conditions.

This means, if inflation increases, the flow of portfolio investment in the country will also increase.

Based on table 1, estimation model for the equation of the Total Money Supply in ASEAN Upper Middle Income countries can be written as follows:

$$Y2 (M2) = 29.6180 - 129.7898 Y1 (INV \text{ Portofolio }) + 0.7424 X3 (INF) - 0.0531 X4 (RIR) - 0.9410 LOGX5 (EXP).$$

Statistically, the model used is fit and valid. Indicated by the F-statistic probability value of 0.000 at a significance level of 5 percent. This means that simultaneously, the exogenous variable has no significant effect on the rejected endogenous variable and in H1 there is at least one exogenous variable that is accepted. In other words, the four exogenous variables used in this study, namely portfolio investment, inflation, interest rates and government spending together affect the money supply in ASEAN upper middle income countries. The R-squared value obtained in the model is 0.6027, which means that all exogenous variables in this study are able to explain the proportion of diversity (variance) of the endogenous variables by 60.27 percent, while the remaining 39.73 percent is explained by other variables outside the model.

The parameter estimation results in the model shown in table 1 show that the portfolio investment variable (Y1) has a significant influence and has a negative relationship to the growth of the money supply in ASEAN upper middle income countries at a significance level of 5 percent. This means that every one percent increase in portfolio investment flows causes a decrease in the growth in the money supply by -129.7898 units during *ceteris paribus* conditions. This means, the higher the growth of a country's portfolio investment will reduce the opportunity to increase the money supply in that country. The parameter estimation results in the model shown in table 1 show that the inflation variable (X3) has a significant and positive effect on the growth of the money supply in ASEAN upper middle income at a significance level of 5 percent. That is, every one percent increase in a country's inflation rate causes an increase in the growth of the money supply by 0.7424 units during *ceteris paribus* conditions. This means, the higher the inflation rate in a country will provide an opportunity to increase the money supply in that country.

The parameter estimation results in the model shown in table 1 show that the interest rate variable (X4) has no significant effect and shows a negative relationship to the growth of the money supply in ASEAN upper middle income countries. That is, every one percent increase in a country's interest rate causes a decrease in the growth of the money supply. This means, the higher the interest rate in a country will reduce the opportunity to increase the money supply in that country.

The parameter estimation results in the model shown in table 1 show that the government expenditure

variable (X5) has no significant effect and has a negative relationship to the growth of the money supply in ASEAN upper middle income countries. That is, every one percent increase in government spending in a country causes a decrease in the growth of the money supply. This means, the more government spending in a country will reduce the opportunity to increase the money supply in that country.

Table 1. Results of Simultaneous Two Stage Least Square Panel Model Analysis

Endogenous Variables	Exsogenous Variables	Coefisient	t-satistik
Portfolio Investment	Stock Price (X1)	0.002858	2.392546
	Economics Growth (X2)	-0.024457	-3.037670
	Inflation (X3)	0.004176	2.170948
	Money Supply (Y2)	-0.005328	-3.742181
	R Squared	0.476236	
	Prob F Statistic	0.000001	
Money Supply	Inflation (X3)	0.742447	3.089451
	Interest rate (X4)	-0.053064	-0.292419
	Governerment Expenditure (X5)	-0.940995	-0.712020
	Portfolio Investment (Y1)	-129.7898	-2.397557
	R Squared	0.602703	
	Prob F Statistic	0.000000	

statistic relationships are significant at 5 %

The money supply (money supply) is the total stock of money in an economy in a certain period which is usually in the time curve of one fiscal year. According to Siregar (2011), an increase in the money supply held by the public with reasonable growth will have a positive impact on the economy and equity market in the short and long term. High asset prices will increase the desire of investors to invest in portfolio investments in a country. In line with that, Murdiah & Bowo (2020) also stated that if there is an excess of money supply, it will encourage inflation, which will disrupt economic development. Then the Central Bank of a country will certainly take a policy of lowering interest rates. This condition will encourage investors to invest in the country. A reasonable increase in the money supply in the community will affect the increase in asset prices in the capital market, high asset prices will provide the expectation of a high rate of return. This will certainly encourage investors to invest in portfolios. An increase in the money supply will increase the country's economic activity, and create a potential market for investors to invest so that portfolio investment will increase. In this

study the indicator used to see the money supply is an indicator of the growth in the money supply in ASEAN upper middle income countries. The estimation results in table 1 show that there is a significant negative relationship between the money supply and portfolio investment in ASEAN upper middle income countries. This explains that the growth in the money supply provides an opportunity to decrease investor interest in investing in a portfolio in this upper middle income country in ASEAN. This is not in line with research (Siregar, 2011). The negative relationship between the money supply and portfolio investment is caused by a high increase in the growth in the money supply which results in inflation. This is shown by where the average growth in the money supply in the three ASEAN upper middle income countries is at 9.13 percent per year, where the increase is greater than 5 percent per year. This will trigger an increase in inflation. If inflation increases, it will affect the low interest of investors to invest in that country

Based on the estimation results of the portfolio investment equation in table 1, it can be seen that stock prices have a significant and positive relationship to the growth of portfolio investment in ASEAN upper middle income countries during the study period. This explains that the increase in stock prices provides an opportunity for increased investor interest to invest in a portfolio in ASEAN upper middle income countries. That is, when the stock price is high, the interest of investors to invest in a country becomes excited and increases. An increase in stock prices usually indicates an improvement in economic performance, whereas a decline is usually caused by the fact that a country's economy is in trouble. The results of this study are in line with the theory which states that an increase in a country's stock price indicates an improvement in a country's capital market, so this will affect the interest of investors to invest in that country (Haider, 2017).

The increase in economic growth shows the greater potential for growth in the size of a country's market which will be an attraction for investors so that the flow of portfolio investment into that country will also be higher. Based on the estimation results of the portfolio investment equation in table 9, it is known that the economic growth shown by the GDP indicator has a significant influence on the growth of portfolio investment in ASEAN upper middle income countries and the relationship shown is a negative relationship. That is, when economic growth increases, portfolio investment entering a country actually decreases. This is in line with research (Maulana, 2013; Dua & Garg, 2013). High economic growth in a country also explains that the market capacity is open for the company's products and can then show potential profits for companies that can take advantage of the open market for investment purposes. This is then seen by investors as a positive thing to get ownership of securities from state companies that have the advantage and ability to take advantage of the potential of the open market. This condition then encourages an increase in the demand for securities or portfolio investments in companies in the capital market. Although the effect shown is significant, the results of this study find that economic growth has a negative effect on the growth of portfolio investment flows in a country. This can happen because of issues that occur in the country, such as health issues, natural disasters and political issues that are the background of a country so that investors are not interested in investing in portfolios in that country.

Based on the results of this study, the inflation rate has a positive and significant influence on the growth activities of portfolio investment flows in upper middle income ASEAN countries. The research findings are not in accordance with the empirical results of research findings (Lesotho, 2006; Wardhono & et al, 2020),

where the results of his research find that the inflation rate has a negative effect on investment development. Many economists have the opinion that high inflation tends to have a negative effect on portfolio investment. The results of this study are different from that opinion, where the results of the study actually show the opposite situation. Which means, higher inflation actually encourages an increase in portfolio investment growth in the three ASEAN upper middle income countries. This can happen because if an increase in the inflation rate results in an increase in income that is greater than an increase in costs, the effect of inflation on portfolio investment is positive. In this case, the increase in profit margins can certainly stimulate entrepreneurs to widen their production by investing in the form of investment portfolios. Another reason for the discrepancy between the results of this study and previous research is that the inflation rate in the three ASEAN upper middle income countries during the year of observation was still under 10 percent. The results of this study are in line with research conducted (Suhendra & Istikomah, 2016), which states in the findings of his research that the increase in the inflation rate that occurs can still be within the tolerance limit of investors and is not much different from the expected inflation value set by the central bank, so that this increase in inflation is actually able to encourage an increase in the flow of portfolio investment growth in Indonesia. The inflation rate did not have a major effect on the flow of portfolio investment into these three countries. This finding indicates that investors are less influenced by expectations based on inflation so that the presence or absence of inflation in a country becomes a condition that is considered normal. If it is associated with foreign investors, investors also see that inflation does not only occur in this upper middle income ASEAN country, but investors also calculate inflation in their country and inflation in the world. The findings of this study are also confirmed by research findings (Hadi & et al, 2017) which state that when there is a change in inflation, it will not reduce portfolio investment, which means that changes in inflation do not cause shocks to portfolio investment growth.

In theory, an increase in investment will have an impact on increasing the money supply in a country. When investment increases, the national income of a country will increase, which means an increase in income in the community. The increase in people's income then causes

public consumption to increase and in turn will also cause an increase in the money supply. An excessive increase in the money supply can encourage inflation so that it can certainly disrupt economic growth. If there is an excess of money supply, the central bank will take a policy of lowering interest rates. This condition encourages investors' interest to invest. The results of the study which showed a significant negative relationship could be caused by an increase in the value of investment that occurred in Indonesia, Malaysia and Thailand which was then followed by an increase in national income. This causes an increase in people's income, but here people prefer to save their money (saving) rather than spending it or using it again for investment so it does not cause an increase in the money supply in the country. This result is in line with research (Murdiah & Bowo, 2020) which states that there is no positive two-way causality relationship between the money supply and portfolio investment.

Inflation is one form of economic disease that is often experienced by almost all countries. In the economies of upper middle income ASEAN countries, the problem of inflation is a very important macroeconomic indicator because if not addressed immediately, the inflation rate will have a severe negative impact on the economy. The relationship between the inflation rate and the money supply can be seen in the theory proposed by Irving Fisher and Keynes. So it can be concluded that high growth in the money supply is often one of the causes of high inflation rates, increasing the money supply in the community will increase aggregate demand, which in the end, if not followed by growth in the real sector, will cause price levels to rise.

Based on the estimation results of the money supply equation in table 1, it is known that inflation has a positive and significant effect on the money supply. This indicates that when the inflation rate increases, the money supply in the community will also increase. The results of this study strengthen several previous studies, including research on the causal relationship between inflation and the money supply in Indonesia, where the results show that the money supply has a two-way positive causal relationship with inflation in Indonesia (Susilowati, 2016). Then research (Sultana & et al, 2019), which examines the relationship of inflation to the money supply widely in Bangladeshi society. His research findings state that inflation, both in the short term and in the long term, can significantly affect the growth of the money supply in the community positively. Meanwhile, (Koyuncu, 2014; Kamal, 2016) in his research found that there is a two-way causality between inflation and the money supply in the long run, where when inflation increases it will also stimulate an increase in the money supply.

If the interest rate increases, the amount of savings will also increase because the interest rate is expressed as a percentage of principal per unit of time. This is very logical because interest rates are an attraction so that people who have excess funds will save and are also a measure of the resources used by debtors that are paid to creditors. The government can use interest rates to control the money supply. That is, the government can regulate the circulation of money in an economy. The estimation results of the equation for the money supply in table 10 show that there is a negative and insignificant relationship between the real interest rate and the money supply. This means, when real interest rates increase, the money supply in the community will decrease. Interest rates are useful for stabilizing the money supply in the long run. If the money supply is too large, it will have a positive impact on the target interest rate by increasing the interest rate gradually so that the money supply remains stable. The findings of this study indicate that there is no significant relationship between interest rates and growth in the money supply. The movement of real interest rates in the Three Upper Middle Income ASEAN countries does not show significant changes every year. Thus, when interest rates increase with an increase that is not too large, it actually causes the money supply in the community to increase because the increase in interest rates does not affect people's desire to invest in the country This can be seen from the growth in investment value in this case portfolio investment in ASEAN upper middle income countries on average.

An increase in government spending will directly increase aggregate demand. A reduction in taxes allows more income to be spent on spending and increases aggregate demand by increasing consumer spending. Since disposable income is fixed, the increase in government spending must be met by decreasing the amount of investment by the same amount. In other words, government spending has a negative relationship to the money supply. This means that when government spending increases, the money supply will decrease. The estimation results from the equation of the money supply in table 10 in this study indicate that there is a negative but not significant relationship between government spending on the growth of the money supply. This indicates that when the government's fiscal policy through government spending increases, the money supply will experience a chance to decrease.

Government spending is done by reducing the amount of government investment, when investment decreases, the money supply will also decrease. The results of this study are in line with research (Wijaya, 2015), which states that aggregate demand is largely determined by fiscal policy in the form of government spending because the government must always be active in encouraging an increase in aggregate demand. When the factor of increasing aggregate demand occurs, the impact is that households and companies will increase their spending and this will cause aggregate demand to increase and then will increase the money supply in the community. In addition, according to (Baek, 2006), portfolio investment to ASIA countries is "hot money" because it is vulnerable to changes in the world's global financial conditions and atmosphere. Thus, the influence of macroeconomic variables in the country itself on portfolio investment flows will also be strongly influenced by global markets and other external factors, so that capital flows in the form of portfolio investment will become unstable, prone to withdrawals and speculative.

4. CONCLUSIONS AND SUGGESTIONS

In this study, it was found that portfolio investment and the money supply had a negative relationship. This needs to be a concern of the government in maintaining the money supply to increase steadily so as not to disrupt the economy, which in turn can further increase the flow of portfolio investment to the country. The stabilization of the money supply must be controlled by the monetary authorities through strong financial integration and an expansionary economic monetary policy, because it can increase output and also increase the domestic market potential for local and foreign investors in a portfolio, thereby increasing the flow of portfolio investment in ASEAN Upper Middle Income countries. . But of course this also needs to consider the impact on inflation in the country.

Then the monetary authorities and policy makers in the three ASEAN Upper Middle Income countries need to pursue a more appropriate strategy in their country's economy to increase the flow of portfolio investment, in this case it also needs to consider other external factors both from within and outside the country so that it does not affect the decision. investors to invest in a portfolio.

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