Monetary Transmission of State Emerging MarketsLine Asset Prices: Inflation Control Leading Indicators

Rusiadi[1*], Ade Novalina[1], Andysah Putera Utama Siahaan[2]

[1]Faculty ofSocial Science,Universitas Pembangunan Panca Budi, Medan, Indonesia

[2]Faculty ofScience and Technology,Universitas Pembangunan Panca Budi, Medan, Indonesia

ABSTRACT

This study examines the problem of transmission that does not cause the final goal of the policy is not achieved. The target is to determine the leading indicator of the most dominant variable in controlling inflation in emerging market countries. Data analysis using Vector Autoregression. The result of the study states the Effectiveness of policy recommendations in the short-term policy to control inflation is by increasing investment and consumption. The effectiveness of the policy recommendation of medium-term control policy to control inflation is recommended with increased investment and interest. The effectiveness of long-term recommendation of control policy is recommended by investment and money supply.

Keywords: *Monetary Transmission, Leading Indicators, Emerging Markets, Line Asset*

1. INTRODUCTION

The problem that often arises in monetary transmission mechanism is the transmission is not by the original purpose even cause shock and negative impact on the economic conditions. One of the causes of the negative impact is the lag effect in monetary policy, thus encouraging the need to understand the mechanism of monetary policy transmission to real economic activity, which the mechanism can be traversed by various channels or channels[1]. Saida [2][3]said interest rates significantly affect inflation. The inflation rate can be controlled through interest rate policy [4]. United States dollar exchange rate and lending rate affect the export of Indonesia, then Rusiadi and Novalina[5][6]states monetary transmission is very important in controlling stability. Exports have a positive and significant impact on foreign exchange reserves. Asset pathway affects economic growth and inflation[7]. Natsir [1]which shows labor and net exports affect economic growth. Silvia [2] states that economic growth is affected by consumption, net exports, and investment. Indonesia rose to fifth because of rising growth in chemical products, as well as industrial manufacturing and financial services [8][9].

Emerging economies "E11," comprising Argentina, Brazil, China, India, Indonesia, the Republic of Korea, Mexico, Russia, Saudi Arabia, South Africa and Turkey. The scale of emerging market economic growth will be the key to the creation of momentum of world economic growth where 70% of global economic growth in 2013-2030 period will come from this developing country. While trade between emerging market countries has the potential to contribute 40% of world trade in 2030 or up from the current position of only 18% (Sugandhi, 2018). Very dominant emerging market countries continue to be reviewed by BBVA Research (2017) introduced the concept of "EAGLEs" or the abbreviation of Emerging and Growth-Leading Economies.

EAGLEs is a concept that contains ten economic powers including China, India, Brazil, and Indonesia. Alicia Garcia-Herrero states that Indonesia is one of the important economic forces in the list of EAGLEs. Ten years to come Indonesia will be the fifth largest contributor to global growth after China, America, India, and Brazil. On this basis, Indonesia is well on the list of the most promising economies for investors. The importance of the emerging market's contribution to the world economy makes EAGLEs will allow investors to have an up-to-date perspective on emerging markets, particularly about some of the countries that play an important role for the global economy.
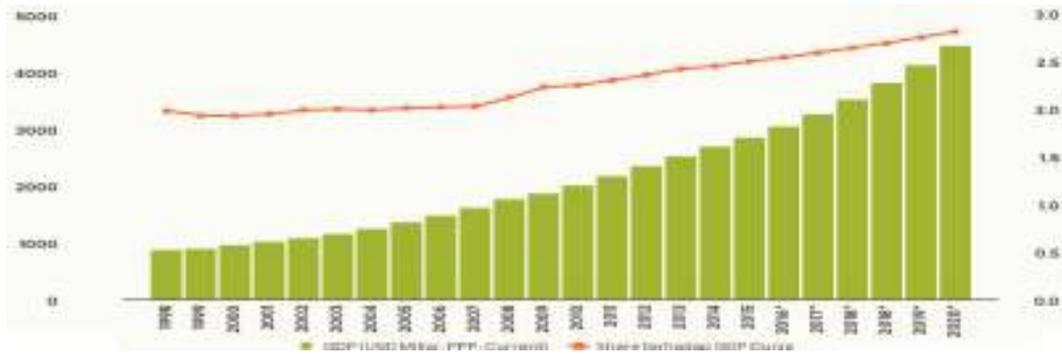
Figure 1: The Role of Indonesia Against the World Economy

Investment is the primary driver of the Indonesian economy. From 2008 to 2015, per year, investment contributes an average of 33.51 percent to national GDP. Meanwhile, in 2021, its contribution is projected to reach 36.44 percent. Government spending is projected to decrease if in 2015 its contribution to GDP is 17.44 percent then in 2021 to 16.92 percent.
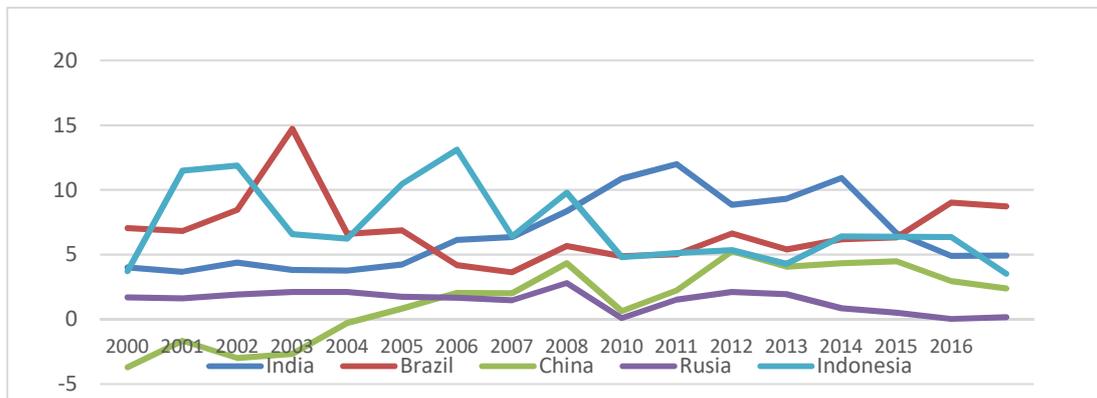

Figure 2: Inflation rate of emerging market countries from 2001 to 2016

Based on the charts and graphs above, there was an increase in inflation in emerging market countries in 2008, India's inflation up 8.35% from 6.36% the previous year. Brazil rose 5.66% from 3.66% the previous year, China rose 6.46% from 2.87% the previous year, Russia rose 14.10% from 9.00% the previous year, Indonesia 9.77% from 6, 41% the previous year. Westermeier [10] states the negative impact of rising interest rates will increase prices and the economy in general. Natsir [11] states that interest rates function efficiently as operational targets. The reliability of the use of interest rates in the pursuit of policy targets in the form of inflation. The tightening of the interest rate can also protect the price fluctuations[12][13][2]. Monetary policy should facilitate a favorable investment climate through appropriate interest rates, exchange rate and liquidity and money market management mechanisms[14]. The interest rates are mostly related to price increases. These results provide evidence of the existence of functional interest rates in the economy of Zambia[1][15].

2. THEORIES

2.1 Open Economy with * IS-LM *

The open economic monetary analysis with rational expectations includes the determination of a floating exchange rate. Trade relations with a particular country subscribe to a banknote or fiat money system, meaning that banknotes sold by the monetary authority are a means of internal transactions. The foreign exchange market determines the price of one unit of the currency against the other, called the exchange rate. The use of the macro-economic aggregation model is an analytical tool in the determination of exchange rates. The inclusion of international trade in the IS Model explains the open economic model, such as:

$$y = c + i + g + x$$

Where:
y = the real output of aggregate
c = real household consumption

i = investment or real consumption of the company

g = real consumption of government

x = net real exports

If the net real export exports the domestic production is greater than the sum of consumption, investment, and government consumption. The real consumption of households is determined by the real output of aggregate and the real interest rate, i.e., c = C (y, r). The real consumption of the firm is also determined by the real output of aggregate and the real interest rate, i.e., i = I (y, r). Net real exports are a negative function of relative export prices with imports [Q] and relative domestic outputs with overseas [y*], such as:

$$x = x\left(Q, \frac{y}{y^*}\right)$$

Substitutions will produce IS models in an open economy:

$$y = C(y,r) + I(y,r) + G + x\left(Q, \frac{y}{y^*}\right)$$

$$y = D(r, Q, y^*, g)$$

where D_r, $D_Q < 0$ and D_{YF}, $D_G > 0$. The explicit equation formulationexemplifies the aggregate output ln (Y_t) = y_t and the relative price is ln (Q_t) = q_t. The open economy IS model in linear form can be formulated with three equations, that is:

$$y_t = \beta_0 + \beta_1 r_t + \beta_2 q_t + v_t$$

where $\beta_1, \beta_2\ \pi\ 0$. The real interest rate is the nominal interest rate reduced by inflation expectations, such as:

$$r_t = R_t - E_t(p_{t+1} - p_t)$$

The relative price of domestic products to foreign products depends on the exchange rate. Suppose the domestic price level is ln (P_t) = p_t, the price level abroad is ln (P^*_t) = p^*_t and the domestic

exchange rate is ln (E_t) = e_t, so the relative price is:

$$Q_t = \frac{P_t}{E \times P_t^*} \text{ or } q_t = p_t - (e_t + p_t^*)$$

The LM model of open economics consists of two similarities, namely money demand and interest rate parity conditions. The domestic interest rate [R] is the foreign interest rate [R*] plus the expected depreciation of the domestic currency exchange rate. The demand for money stock and interest rate parity conditions are:

$$m_t - p_t = \alpha_0 + \alpha_1 y_t + \alpha_2 R_t + \varepsilon_t$$

$$R_t = R_t^* + E_t(e_{t+1} - e_t)$$

From the previous equation, the price level and the foreign interest rate are exogenous variables. The domestic interest rate and exchange rate are endogenous variables, while the relative price determination, the real aggregate output, and the real interest rate are adjusted to the Classical model or Keynesian model.

2.2 Mechanism of Monetary Transmission Line Asset Prices

The monetary policy transmission mechanism through asset price lines emphasizes the importance of the effect of asset prices in this case of stocks, the effect of monetary policy on asset prices, in turn, affects various activities in the real sector, where consumption also affects investment, GDP, and inflation. Monetary policy affects the development of other asset prices such as stocks, bonds, and prices of physical assets such as property and gold. This transition occurs because of investment funds by investors in their investment portfolio, not only in the form of deposits in banks and other investment instruments in the rupiah and foreign currency money market but also in the form of bonds, shares, and physical assets. Clearly the mechanism of transimission through the asset price channel can be seen in the following figure:
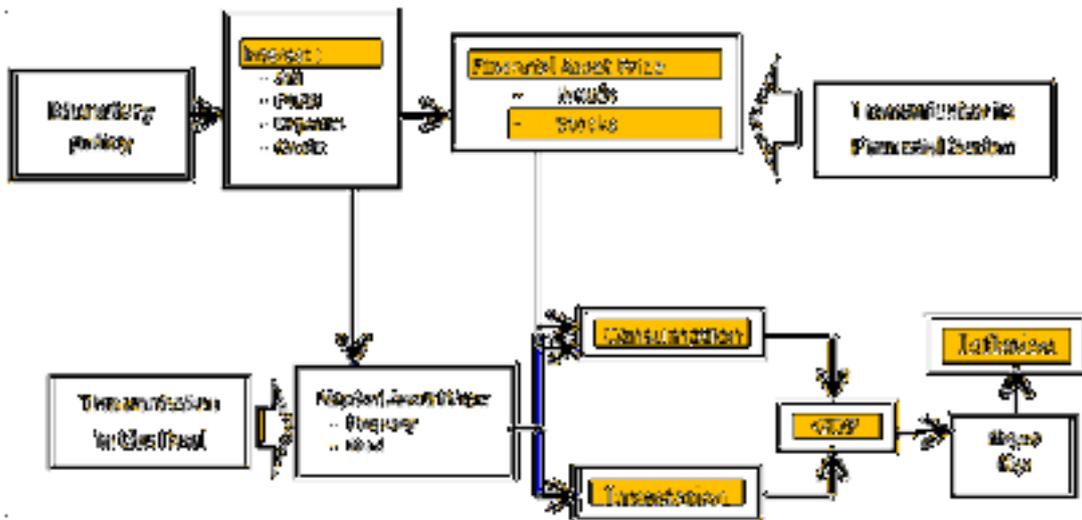
Figure 3: Transmission mechanism through the asset price channel

3. METHODOLOGY

The formulation of the VAR model is not based on economic concepts so the economic interpretation of the VAR model is difficult to define. The results of VDC analysis of VAR and VDC models of SVAR model show the monetary policy shock contribution to deposit and credit banking system, investment, and aggregate output. The stable dynamics of the money stock will ensure a steady dynamic of deposit and credit banking, investment, and aggregate output.

4. RESULT AND DISCUSSION

After testing the assumptions, namely stationary test, cointegration test, lag stability test structure and optimal lag rate determination, then the next step is to analyze the VAR. This analysis is conducted to determine whether there is a simultaneous relationship (interrelated or mutual contribution) between variables, as exogenous variables and endogenous variables by incorporating the time element (lag).
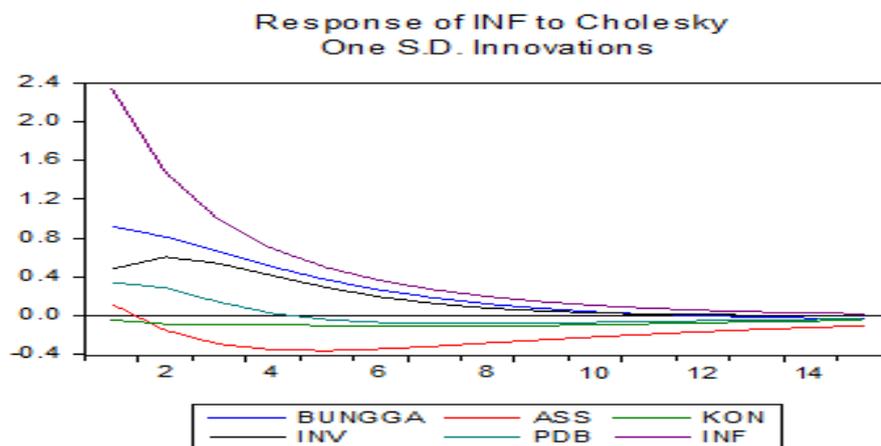
Figure 4: Variable response INF against other variables

Figure 4 describes the change of one standard deviation of INF can be responded by other variables, both monetary and other macroeconomic variables. Based on the above figure the stability of response of all variables formed at period 5 or medium-term and long-term. The stable stability response is due to the movement behavior of INF which is responded by other variables almost equal to the movement in the short term period.

Table 1: Summary of Impulse Response Function INF results

No.	Variable	Short-term	Medium- term	Long-term
1	BUNGA	_	_	+
2	ASET	+	+	_
3	COSUMPTION	_	_	_
4	INV	+	+	_
5	PDB	_	_	_
6	INF	+	+	+

Table 1 describes the increase of INF is positively responded in the long term by the GDP itself. Moreover, in negative response only on the short term by interest, consumption, and GDP. Moreover, responded negatively to the medium term of interest, consumption, and GDP. Long-Term negative response by ASET, consumption, INV, GDP. In the short-term positive response by ASET, INV, and INF and responded positively to the medium term by ASET, INV, and INF. The result that INF in the short term (period 1), the estimated variance error of 5.9% explained by INF. The other most significant variable affecting INF as policy variable besides INF itself is INV 39.0% then ASET 22.2%, consumption 21.8%, INTEREST is 9.4%, while the smallest effect INF is GDP of 1.4%.

Table 2: Varian Decomposition INF

Period	S.E.	INTEREST	ASSET	CONSUMPTION	INV	GDP	INF
1	**2.002457**	**9.473390**	**22.25694**	**21.80293**	**39.01993**	**1.464220**	**5.982592**
2	2.573886	6.198055	23.39996	23.23885	42.12249	0.886277	4.154361
3	2.958426	5.849559	21.77922	19.40430	47.56211	1.050256	4.354558
4	3.359429	5.141719	21.35630	17.70836	49.74889	1.481282	4.563451
5	**3.671085**	**4.790239**	**20.33809**	**17.46297**	**50.31425**	**2.081666**	**5.012786**
6	3.867057	4.398766	19.62912	18.74883	50.02305	2.241934	4.958303
7	3.962754	4.203019	18.98704	19.55814	50.09274	2.299729	4.859332
13	4.124860	4.079548	18.17000	20.54928	49.86726	2.733820	4.600090
14	4.140455	4.174489	18.53393	20.42503	49.51898	2.734915	4.612650
15	**4.158900**	**4.268657**	**18.96129**	**20.24795**	**49.16524**	**2.729381**	**4.627476**

The INF itself explains INF in the short term (period 1), the estimated variance error of 5.9%. The other most significant variable affecting INF as policy variable besides INF itself is INV 39.0% then ASET 22.2%, consumption 21.8%, INTEREST is 9.4%, while the smallest effect INF is GDP of 1.4%. In the medium term (period 5) an estimated variance error of 5.0% is explained by INF. The other most significant variables affect the INF as policy variables other than the INF itself is the INV of 50.3%, then the ASET of 20.3%, the consumption of 17.4%, the 4.7% significant interest while the least affect the INF GDP of 2.0%. In the long run (period 15) the estimated variance error of 4.6% is explained by INF. The other most significant variables affect the INF as policy variables other than INF itself is INV of 49.1%, then consumption of 20.2%, ASET of 18.9%, the interest of 4.2% while the smallest variable affects INF is a GDP of 2.7%.

Table 3: Policy Recommendation for INF

Period	INF	Biggest 1	Biggest 2
Jangka Pendek		INV	ASET

(Periode 1)	5,9%	39,0%	22,2%
Jangka Menengah (Periode 5)	5,0%	INV 50,3%	ASET 20,3%
Jangka Panjang (Periode 15)	4,6%	INV 49,1%	KONSUMSI 20,2%

Table 2 describes the short term, lowering the INF is only done by the INF itself, then in the medium and long-term besides done through INF itself is also influenced by INV. It means that the government will need to lower the INF as well as increase the INV to lower the INF. IRF results suggest that in the short term changes (increase) Inflation is positively responded by asset prices, investment, and inflation but responded negatively by interest, consumption, and GDP. Stock level has a significant positive effect on inflation. In the medium term states that the change (increase) inflation responded positively by all variables of asset prices, investment, and inflation but responded negatively by interest and consumption. There is no significant influence between inflation on North Sumatra investment. Furthermore, inflation only contributes only 1.70% to North Sumatera investment so that the inflation factor does not affect the development of North Sumatera investment, while 98.30% is influenced by other factors such as the amount of local income, the interest rate, the amount money supply, security, and other factors. In the long run, the changes in inflation are responded positively to interest and inflation itself but responded negatively by asset prices, consumption, investment, and GDP. Inflation and deposit rates have an adverse and significant effect on stock returns, while market return has a positive and significant effect on the stock return of consumer goods industry listed on BEI.

Fevd test results show that for the short term inflation control is only done by an investment of 39.0%. Asset price of 22.2. The capital structure and liquidity of the firm have a positive and significant effect on stock investment risk. Operating leverage has no positive and significant effect on stock investment risk and inflation. Deposit interest rate, rupiah exchange rate against US $ and financial leverage partially have an adverse and significant effect on stock investment risk in the pharmaceutical company in BEI period 2009-2013.Then in the medium term policy recommendations to control inflation is through the investment of 50.3% and asset prices of 20.3%. Then in the long-term policy recommendations to control inflation is through the investment of 49.1% and consumption of 20.2. The effectiveness of the monetary policy transmission lines becomes very important, as it is used to know which transmission lines are the most dominant in the economy to be used as the basis for formulating a monetary policy strategy. Also to find out how strong and the duration of deadlines each transmission line works. It is essential to determine which economic and financial variables are the most reliable leading indicators of the inflation movement and which variables as indicators for determining the operational targets of monetary policy (Warjiyo, 2004). The relationship between monetary control instruments and the ultimate goal of monetary policy is indirect and complex and requires a relatively long time. Therefore, experts and practitioners in the field of monetary add indicators called operational goals.

Table 4: Monetary policy transmission leading indicators

No.	Leading Indicator	Transmission Asset Path		
		1 (short-term)	5 (medium-term)	15 (long-term)
1	Interest	Investation, Asset	Investation, Asset	Investation, Asset
2	Currency			
3	Asset	Interest	Interest, Consumption	Investation, Interest
4	Consumption	Asset, Interest	Investation, Asset	Asset, Investation
5	Investation	Interest, Asset	Asset, Consumption	Asset, Consumption

6	JUB			
7	Export			
8	GDP	Asset, Consumption	Interest	Asset, Investation
9	Foreign Exchange Reserves			
10	Inflation	Investation, Asset	Investation, Asset	Investation, Consumption

The conventional monetary transmission has sustained inflation starting from SBI (Magdalena, 2014). The monetary policy transmission mechanism consists of interest, credit, exchange rate, asset prices, inflation expectations. This research uses interest rate path, asset price, and exchange rate. Other studies have nothing in common with these three paths. For example, using one line such as line of credit[12], interest path. Using two lines such as [16] credit line and exchange rateinterest lines, credit and asset prices, assets and exchange rate[17][5][18][19]. Using four lines such interest lines, credit, asset prices, exchange rates and expectations, interest lines, credit, asset prices. Although using three lines but not the same interest path, the price of assets and exchange rate, and using four lines but only one country only. The reason for using these three asset pathways is to override the lines of credit and expectations, where the lines of credit in some studies have excellent interaction with interest interactions so that the mechanisms are mutual and representative. The epistemic path also has characteristics with asset prices and inflation itself. The non-interest rate is the main transmission route and effectively manifests the ultimate goal of monetary policy. The asset price as one of the transmissions can represent demand and expectation side[20]. The concept of a continuous transmission mechanism of exchange rate policy.

5. CONCLUSION

The effectiveness of policy recommendation of control in short-term policy to control inflation is by increasing investment (43.88%) and consumption (26.69%). The effectiveness of the policy recommendation of medium-term control policy to control inflation is recommended with an increase of investment (47.56%) and interest (20.14%,). The effectiveness of long-term recommendation of control policy is recommended by investment (42.14%) and JUB (22.25%). The effectiveness of policy recommendations for short-term control of GDP is only done by asset prices of 34.5% and consumption of 27.4%. The effectiveness of policy recommendation of medium-term control policy recommendation to control GDP is through asset price of 54.9% and interest of 15.4%. Then in the long-term policy recommendations to control GDP is through asset prices of 43.9% and investment of 32.7%. The effectiveness of policy recommendations for short-term control of inflation is made only by an investment of 39.0% and an asset price of 22.2%. Then in the medium term policy recommendations to control inflation is through the investment of 50.3% and asset prices of 20.3%. Then in the long-term policy recommendations to control inflation is through the investment of 49.1% and consumption of 20.2.

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