

## Monetary Policy Interventions Against Emerging Market Exchange Rate Stability in ASEAN

Rika Utami Restihani<sup>1</sup>, Hasdi Aimon<sup>2</sup>

<sup>1</sup>Universitas Negeri Padang, Padang, Indonesia ✉ rikautamirestihani1107762@gmail.com

<sup>2</sup>Universitas Negeri Padang, Padang, Indonesia ✉ s3dkpl@gmail.com

### Abstract

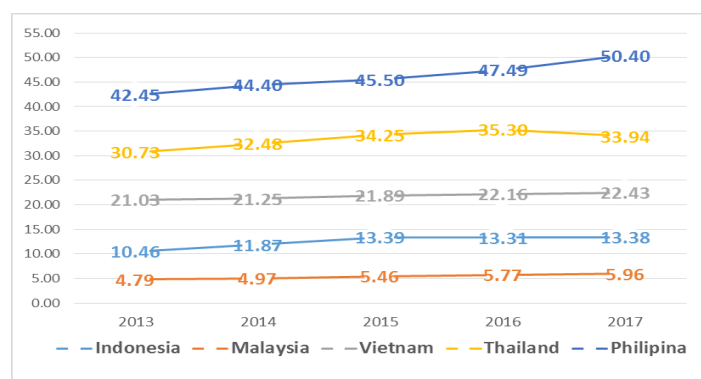
This study aims to examine the short-term relationship and the long-term stability of the real exchange rate of emerging market countries in ASEAN. The data used in this study is panel data of emerging market countries in ASEAN, namely Indonesia, Malaysia, the Philippines, Vietnam and Thailand. This analysis model used is Kao residual Integration test and error correction model (ECM).

*Keywords:* ECM, real exchange rate, policy monetray variable

### Introduction

In an open economic system trade traffic occurs between countries. In such traffic, a measuring tool is needed to compare the value of prices of goods and services between countries, given the different currencies of each country. The exchange rate is defined as the price of a country's currency against another country which includes two currencies, the balance point is determined by the demand and supply sides of the two currencies or in other words the amount of money from a certain currency that can be exchanged for one unit of currency. Other currencies (Ekananda, 2015).

In addition, in international trade the exchange rate is able to coordinate decisions between sellers and buyers in the market when they carry out international transactions (Mankiw, 2003). Considering the importance of Exchange Rates for a country's economies, especially in the international economy is no exception to emerging market countries in ASEAN, it is very important for these emerging market countries to maintain their exchange rate stability. Emerging Market Countries are defined as countries with low economies heading to middle level of income per capita. The country is 80% of the global population, and represents around 20% of the world economy. The term was coined in 1981 by Antoine W. Van Agtmael of the International Finance Corporation of the World Bank. In ASEAN, based on IMF groupings by Indonesia, Malaysia, the Philippines, Vietnam and Thailand, including the Emerging Market Countries in ASEAN.



Source: IMF (Authors' calculations)

**Figure 1 The Development Of The Exchange Rates Of Emerging Market Countries**

The picture above illustrates the development of the exchange rates of emerging market countries in ASEAN, namely Indonesia, Malaysia, Vietnam, Thailand and the Philippines. The chart above shows that the exchange rates of these countries tend to depreciate as illustrated by the trendline in the chart above.

However, in certain years, Indonesia and Thailand experienced appreciation, namely the strengthening of the domestic exchange rate against the dollar. Appreciation for the State of Indonesia occurred in 2016, amounting to Rp. 13,308 per dollar. This strengthening is thought to be from the domestic factors of the State of Indonesia namely the efforts to improve investment performance by the government so as to encourage cashflows where the strengthening of the exchange rate is one of the tools by the government to trigger investors in channeling funds to Indonesia.

In 2017 Thailand also experienced a strengthening of the currency value of 35.30 bath / dollar triggered by external factors namely the improvement of the global economy in the form of manufacturing and trade as well as the benefits derived by floating countries from their exports from the strengthening of export commodity prices.

In addition, monetary policy is an appropriate intervention tool in maintaining the stability of a country's exchange rate. Given the variables in monetary policy that have a direct influence in controlling the stability of Exchange Rates. Monetary variables that are able to control the stability of Exchange Rates are one of them, namely interest rates, especially the reference interest rates in a country.

In the monetary system, interest rates have a direct influence in making a decision both affecting the economic decisions of businesses or businesses and households because they have consequences for the health of a country's economy (Mishkin, 2006). In addition, the contraction and expansion in the benchmark interest rate are inseparable from the money supply. The amount of money in a position is able to influence the economy because in its development the amount of money in circulation is able to encourage demand for goods and suits which in turn can stimulate an increase in nutrients - prices (Natsir, 2014).

In addition to intervention through monetary policy, monetary authorities can also control the stability of the exchange rate through price pressures and increased exports. Basically an increase in the inflation rate indicates economic growth, but in the long run a high inflation rate can have a bad impact. The high level of inflation causes the price of domestic goods to be relatively more expensive compared to the prices of imported goods.

In the introduction the background of this research has been discussed then proceed to the second part which explains the methodology followed by the third section that discusses the results of the analysis and discussion and concludes with the fourth part, namely conclusions.

## Methods

In this study, the method used is the Kao residual integration test and error model (ECM) where the data used is panel data from 2000 to 2018 consisting of 5 countries namely Indonesia, Malaysia, the Philippines, Vietnam, and Thailand. The long-term model in this study is as follows:

$$REER = f(M2, IR, GDEF, NX) \quad (1)$$

Where REER is the real effective exchange rate (index of domestic currency of the country against the dollar) And the growth of the domestic money supply (M2) and the reference interest rate of each domestic country (IR). GDEF is the price level between countries and net exports is the difference between exports and imports (NX). Panel data used in this study were sourced from Fred Economic Bank (REER), World Bank (M2 and GDP deflator) and the International Monetary Fund, which were presented in the form of percentages.

$$REER_{it} = \alpha_0 + \alpha_1 M2_{it} + \alpha_2 IR_t + \alpha_3 GDEF_t + \alpha_4 NX_t + \varepsilon_t \quad (2)$$

where  $\varepsilon$  is the error term. The hypothesis used in this study is  $\beta_1 < 0$  which means that the money supply affects the real exchange rate with a negative coefficient,  $\beta_2 > 0$  which means that interest rates affect the real exchange rate with a positive coefficient,  $\beta_3 < 0$  which means that inflation influences the value of real exchange with a negative coefficient and  $\beta_4 > 0$ , which means an increase in net exports affects the real exchange rate with a positive coefficient

In equation 3 there is ECt-1, which serves to interpret the short-term dynamics so that the error correction model (ECM) is as follows:

$$\Delta REER_t = \beta_0 + \beta_1 \Delta M2_t + \beta_2 \Delta IR_t + \beta_3 \Delta GDEF_t + \beta_4 \Delta NX_t + EC_{t-1} + v_t \quad (3)$$

where  $EC_{t-1}$  = error-correction term lagged one period.

There are three steps in this method namely the first unit root test is useful to see the condition of data stationarity so that it reduces errors in the model where the test used in this study is Augmented Dickey-Fuller (ADF). Second, the cointegration test which looks at whether two or more variables have a long-term equilibrium relationship where the test used is the Kao Residual Integration Test. Third, after the cointegrated model, we can determine the error correction model (ECM) that has been estimated.

## Results and Discussion

### Unit root test

The unit root test in this research is very important before the second step is cointegration test. This test is intended to analyze the level of data stationarity so that no spurious regression conditions occur. In this study the unit root test used was Augmented Dickey Fuller.

Unit Root Test in table 1. Using ADF, it can be seen that there are no stationary variables, but in the 1st difference, all stationary variables except GDEF, so the testing continues at the 2nd difference level. at the 2nd difference level all stationary variables with a probability value of 0.000 or smaller than 0.05.

Table 1. Unit root test Augmented dickey fuller

Variable	Level	1 <sup>st</sup> difference		2 <sup>nd</sup> difference		Order of integration	
		Prob. Values	Prob. Values	Prob. Values	Prob. Values		
		Constant		Constant			
RER	15.2454	0.1234	2.75234	0.0021	43.6816	0.0000	I(I)
M2	7.21394	0.7051	18.3718	0.0490	53.3067	0.0000	I(I)
IR	16.0201	0.0991	33.2456	0.0002	41.5745	0.0000	I(1)
GDEF	3.44336	0.9690	17.7188	0.0599	45.9163	0.0000	I(1I)
NX	10.0901	0.4326	30.2497	0.0008	52.8385	0.0000	I(1)

Notes: ADF test was performed using Eviews 8.0.

### Cointegration test

Kao Residual integration test used in this study to see the long-term balance. Table 2 shows the probability value of 0.0029 or smaller than 0.05 which means there is cointegration between variables and it can be concluded that there is a long-term relationship between exogenous and endogenous variables in this study.

Table 2: KAO Residual Cointegration Test

	t-Statistic	Prob.
ADF	-2.756151	0.0029

Estimated Ordinary Least Square (OLS) table 3. Shows that the variable interest rates (IR), inflation (GDEF) and net exports (NX) in the long run significantly affect the effective real exchange rate of emerging market countries in ASEAN. A one percent increase in interest rates makes the exchange rate of emerging market countries depreciate as well as the level of net exports. In contrast to the increase in inflation that actually makes the exchange rate appreciate. Another thing is that the money supply in the long run has no significant effect and a one percent increase in the money supply will strengthen the exchange rates of emerging market countries. This finding confirms previous research which states that prices, interest rates, and net-exports significantly affect the exchange rate (Bahmani & Motavallizadeh, 2017; Blau, 2018; Bouraoui & Phisuthtiwatcharavong, 2015).

**Table 3: estimation of Ordinary Least Square (OLS)**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	65.29750*	3.935423	16.59225	0.0000
M2	0.111789*	0.027707	4.034734	0.7832
IR	- 0.974402*	0.269596	-0.275974	0.0000
GDEF	0.228141	0.029821	7.650389	0.0332
NX	- 0.223685*	0.103413	-2.163035	0.0001
R-squared	0.584323	F-statistic	31.62854	
Adjusted R-squared	0.565848	Prob(F-statistic)	0.000000	

Note: \*, \*\*, \*\*\* represents statistical significance at the level of 1%, 5%, and 10%

### Estimation of the error correction model

The next discussion is the short-term relationship between the money supply, interest rates, inflation and net exports. Based on table 4, the RES value (-1) <0.05 percent indicates that in the short term there is a stable exchange rate. The coefficient of determination R<sup>2</sup> is very low, which is 16 percent of the total variation of the real exchange rate in emerging market countries in ASEAN.

**Table 4 Estimasi error- correction model**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	- 0.287846	0.721429	-0.398994	0.6909
D(M2)	0.060635	0.084887	0.714307	0.4770
D(IR)	0.659090	0.279245	-2.360256	0.0206
D(GDEF)	- 0.245957	0.125145	1.965373	0.0527
D(NX)	0.151310	0.154960	0.976442	0.3316
RES(-1)	- 0.787630	0.070341	-2.500496	0.0143
R-squared	0.162769	F-statistic	3.266137	
Adjusted R-squared	0.112993	Prob(F-statistic)	0.009606	

Note: \*, \*\*, \*\*\* shows a significant level of 1%, 5%, and 10%

Estimation results show that a lag term error significantly affects shocks to the current account balance. This condition shows that there is a disequilibrium in the short-term relationship between money supply (M2), Price Level (GDEF) and Net Export (NX) with Real Effective Exchange Rate. This finding reinforces previous findings which state that the money supply, the price level, and net exports are confounding variables in the short-term exchange rate equilibrium (Adusei & Gyapong, 2017; Chen & Chou, 2015).

The coefficient of determination R<sup>2</sup> is 16 percent of the total variation in real effective exchange rate in ASEAN emerging market countries, which can be explained by the macroeconomic variables investigated. Meanwhile, the term error correction describes the proportion of imbalances in the real effective exchange which, in the long run, can be corrected annually at a significant level of 1 percent. Around 33 percent of imbalances in the current account balance shocks are corrected every year in ASEAN emerging market countries.

### Conclusion

Exchange rate stability is the main objective of policies to maintain the stability of a country's economy. The importance of implementing integrated policies and controlling macroeconomic conditions is a major step in achieving this. Monetary policy intervention is an important step in maintaining exchange rate stability and balance. Based on the results of cointegration and ECM tests, it was found that the money supply, the price level, and net exports disturbed the exchange rate balance in the short term. Therefore, monetary authorities need to intervene in policies related to controlling money supply and price levels, and

integrating monetary policy to adjust the value of net exports in an effort to maintain exchange rate equilibrium.

## References

- Adusei, M., & Gyapong, E. Y. (2017). The impact of macroeconomic variables on exchange rate volatility in Ghana: The Partial Least Squares Structural Equation Modelling approach. *Research in International Business and Finance*, 42, 1428–1444. <https://doi.org/10.1016/j.ribaf.2017.07.081>
- Alagidede, P., & Ibrahim, M. (2017). On the Causes and Effects of Exchange Rate Volatility on Economic Growth: Evidence from Ghana. *Journal of African Business*, 18(2), 169–193. <https://doi.org/10.1080/15228916.2017.1247330>
- Aye Khin, A., Yet Yee, C., Su Seng, L., Mei Wan, C., & Qi Xian, G. (2017). Exchange Rate Volatility on Macroeconomic Determinants in Malaysia: Vector Error Correction Method (Vecm) Model. *Journal of Global Business and Social Entrepreneurship (GBSE)*, 3(5), 36–45. Retrieved from <http://gbse.com.my/v3no5may17/Paper-78-i-.pdf>
- Carrera, J. E., & Restout, R. (2008). Long Run Determinants of Real Exchange Rates in Latin America. *Centre National de La Recherche Scientifique, W.P.08-11*. <https://doi.org/10.2139/ssrn.1127121>
- Combes, J., & Kinda, T. (2011). Capital Flows , Exchange Rate Flexibility , and the Real Exchange Rate. *IMF Working Paper*.
- Gharaibeh, A. M. O. (2017). Fundamental determinants of real effective exchange rate: Empirical evidence from Bahrain. *International Journal of Economic Research*, 14(13), 251–267.
- Hafeez-ur-Rehman, Jaffri, A. A., & Ahmed, I. (2010). Impact of Foreign Direct Investment (FDI) Inflows on Equilibrium Real Exchange Rate of Pakistan. *South Asian Studies (1026-678X)*, 25(1), 125–141. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&db=a2h&AN=65566406&site=ehost-live>
- Hussain, M., Berg, A., & Aiyar, S. (2009). The macroeconomic management of increased aid: Policy lessons from recent experience. *Review of Development Economics*, 13(3 SPEC. ISS.), 491–509. <https://doi.org/10.1111/j.1467-9361.2009.00503.x>
- Jayasekara, S. G. S. D. (2017). Exchange Rate Volatility and Foreign Direct Investment in Sri Lanka. *International Journal of Economics* , 9 ( 1 ), 1-14, 9, 1–14. Retrieved from <https://www.researchgate.net/publication/303881056%0AJayasekara>
- Kilicarslan, Z. (2018). Determinants of exchange rate volatility: empirical evidence for Turkey. *Pressacademia*, 5(2), 204–213. <https://doi.org/10.17261/pressacademia.2018.825>
- Luqman, A., & Bashir, F. (2014). Long run Determinants of Real Exchange Rate: An Econometric Analysis from Pakistan. *Pakistan Journal of Commerce and Social Sciences*, Vol. 8(2), 471–484. Retrieved from <https://www.researchgate.net/publication/309556171%0ALong>
- Oriavwote, V. E., & Oyovwi, D. O. (2012). The Determinants of Real Exchange Rate in Nigeria. *International Journal of Economics and Finance*, 4(8). <https://doi.org/10.5539/ijef.v4n8p150>
- Raza, S. A., & Afshan, S. (2017). Determinants of Exchange Rate in Pakistan: Revisited with Structural Break Testing. *Global Business Review*, 18(4), 825–848. <https://doi.org/10.1177/0972150917692210>
- Saeed, A., Awan, R. U., Maqbool H . Sial, & Sher, F. (2012). An econometric analysis of determinants of exchange rate in Pakistan. *International Journal of Business and Social Sciences*, 3(6), 184–196.
- TSEN, W. H. (2014). the Real Exchange Rate Determination: Empirical Evidence From Malaysia. *The Singapore Economic Review*, 59(2), 1450016. <https://doi.org/10.1142/s0217590814500167>