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ORIGINAL ARTICLE

Asymmetrics Exchange Rate Currency In East And Southeast Asia

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Abstract: Purpose - The purpose of this study was to see how asymmetrics of econometric model analysis, to investigate regional currency exchange rates in the east and south east asia (ASEAN). Design / methodology / approach / data - In this study, the data used is the exchange rate of ten countries in the area of East Asia (Hong Kong, China, Japan, Korea) and southeast Asia (Indonesia, Malaysia, Brunei, Singapore, Philipines , Thailand) against currency U $ D. Research Data used Data Stream data base Obtained from Bank Indonesia (BI), the Central Bureau of statistics (BPS) and from other sources Blomberg example during the period January 1, 2004 to December 31, 2014. Findings - with asymmetrics econometric models created to explain how changes in currency exchange rates in the region east and southeast asia in the short term and long term Research limitations / implications -Implication for the world of research, that this research can be made input in seeing how the movement and relationship of currency exchange rates in the region east and southeast asia in particular. Originality / value - The study by using model asymmetrics a study done of Indonesia, which is applied to the currency exchange rate, especially in the east and Southeast Asia region against the US dollar.

Keywords: Foreign Exchange, Stationerity, ECM, Cointegration, VECM, ARDL.

JEL classification: C32, F31, F33, G14, G15

Introduction

Circumstances and economic conditions in the country of Malaysia has still not stabilized until today. The presence of the low incidence of global commodity prices, and coupled with the weakening of economic growth in China as one of the countries that claim to have the power in Asia, hit the economy and the exchange rate of the neighboring country. Currency exchange rate Malaysian Ringgit against the US dollar (USD) until now approaching its lowest level in 17 years, nearly the same as the value of the rupiah against the US dollar (USD). Not only that, Ringgit, Bath and philipinies peso also weakened against the dollar merica (USD).

As preached by Thestar, Ringgit exchange rate has now hit a RM 4.339 per USD. Against the Singapore dollar, ringgit touched a RM 3.056 per dollar Singapore. "This is due to a mixture of political uncertainty, weak data out of China and the decline in commodity prices," said a currency trader as reported by the media Thestar in Jakarta, Wednesday (09.09.15). While the exchange rate is also experiencing the same thing, there is no indication pengutannya against the US dollar.

Moody's Investors Service said in a report yesterday has cut its forecast for economic growth in China and many countries in the Asia Pacific region. "We had previously been expected to raise regional output of the economy this year. Now we expect to slow but sure for 2015 and 2016."

Moody's has revised the economic growth of Malaysia from the previous 5 percent to 4.5 percent next year. China's growth has also been trimmed to 6.3 percent from 6.5 percent and India 7.5 percent to 7.6 percent. "The sharp decline in energy prices hurt Malaysia, where the state revenues from oil and gas reached 30 percent and more than 20 percent was from exports." And to forecast the growth of Indonesia previously in figure 6-7%, to below 5-4% in the last quarter in 2015.

Malaysia has been a trading partner of China since 2008, as well as the state of Indonesia. With the incidence of China's economic slowdown will adversely affect Malaysia and Indonesia, the other not being in the same region. "Now the private consumption slowdown in domestic and external demand (from China) were also down."

Excahnge Rate Theories

Theory 1 - Determination of exchange rates

The occurrence of a process of the exchange rate is the price - which is exactly the same as the other prices - where the amount we have to submit / pay to get something else - in this case on purpose by the author is the currency of another. So that we can draw a conclusion that the occurrence of a process of the exchange rate when the price of one currency with another currency. With the exchange rate of the process can be made a determination in many ways. The provision could also be done by the government or may be biased also by external parties outside the government - as an example of the determination of

the price of gold. Then a price can occur in because the process of buying and selling, or usually we call in terms of the economy with demand and supply. The author uses the following example, if there are a number of values of supply and demand for sterling traded on the Foreign Exchange market and the number of pounds in circulation are not in the know ! Rising demand for sterling currency will force the price up to the equilibrium exchange rate. Where the supply of the same between the purchase and sale occurred or demand and supply, the price of the currency exchange rate will reach a point of equilibrium exchange rate, as shown in the following diagram.

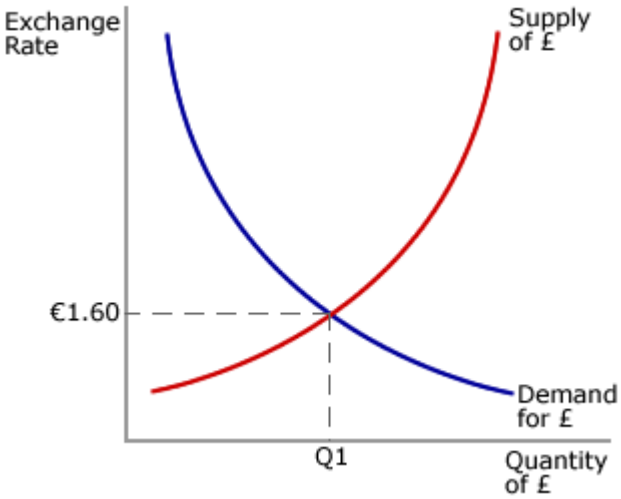

Figure 1. Graph the balance of supply and demand exchange rate POUND

The existence of demand in the currency £ derived from the people who invest in the country from abroad, so they require a lot of pounds, or from companies that buy exports from the country in the country which require £. There are others who need a pound of investors or the company in terms of pay for the goods as a result of trade transactions using the £. The occurrence of a process of supply coming from domestic selling pounds. This can allow them to make purchases of goods from abroad (imports) by currency £, or it may just be that they are investing in the UK and so the country needs to currency £. To get it they have to sell the pound in the exchange of other currencies.

The occurrence of a point of balance between supply demand made, and this will change as demand and changes. For example, that the interest rate increases. This will tend to attract foreign investment (when using the pound currency as a whole) into the country. To carry out these investments, the company will require nvestor or pound, making the demand for the pound to rise. We can see this in the diagram below:

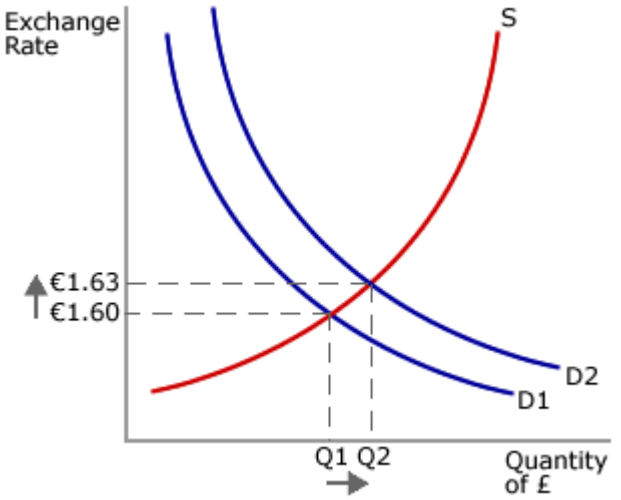

Figure 2. Graph the effect of the increase in demand for the price of the currency exchange rate

If we look at the picture above, the increase in the exchange rate may cause the volume of currency will spend also increased. The incidence of this effect is considered uncertain as any other factors that influence the exchange rate at the same time.

Theory 2 - Fixed v. floating

There are several ways that can be used to determine the exchange rate, the two were in the know is the first to make improvements to the exchange rate it self, by intervening against other currencies, and the second to apply the exchange rate system to a currency exchange rate. There are two models of exchange rate system that we know is the system of fixed exchange rates and floating exchange rate system.

Fixed interest rate

For currency exchange rates that are fixed on the mark with an increasing demand for the currency as shown in the graph below. A shift from D1 to D2 will cause an increase of the exchange rate it self. In this case the policies that can be done is to have to fight the effects of increased demand. Thus the perpetrators will provide more of the currencies traded. Such as the sale and purchase of currency ponud another currency as the pound currency substitute. The implication is a shift in the supply curve to S2, and conduct a policy of maintaining a fixed rate.

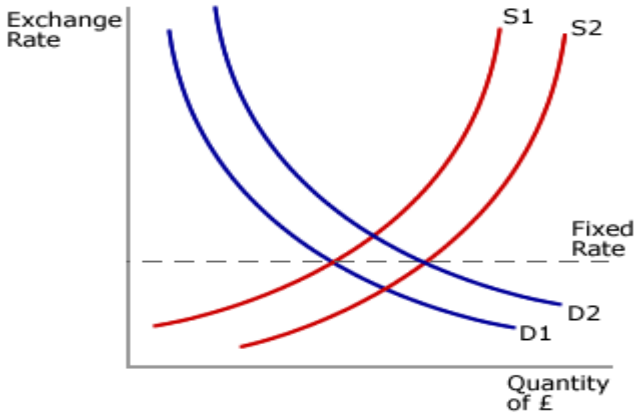

Figure 3. Graph fixed exchange rate system

In order to maintain the exchange rate, one of the market participants to sell the pound currency and buying foreign currency, so that the things done that can increase their holdings of foreign currencies.

Floating rate

Floating exchange rate system is a system of exchange rates on the basis of the strength of the influence of supply and demand. The model for the level of the balance of this system will be achieved if there is a place that is considered the same supply with demand will be undertaken, on these events will be able to change some of the demand and the occurrence of some changes. It can be seen from the figure below. In the image seen an increase in demand for the pound resulting in a shortage on the pound is needed in the market, so as to make the exchange rate to rise, settling at a new equilibrium level of € 1.65.

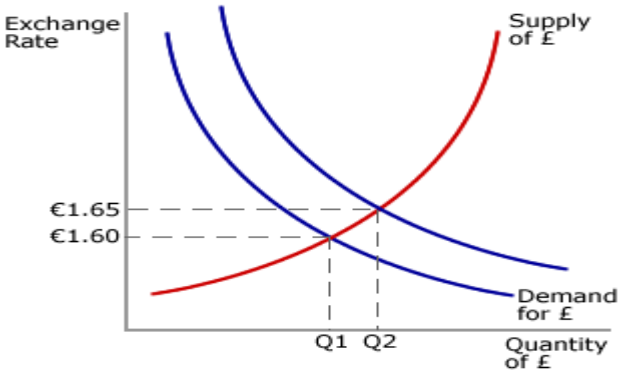

Figure 4. Graph floating exchange rate system

Theory 3 - Market intervention

For this third theory of government intervention is very or could determine once, but it's not necessarily have an impact on the market have a major influence. We take one example, if exchange rate has been depreciating for some time due to the sale of one currency is the pound, with this incident the government intervention measures by conducting a policy to make a slow pace over the fall of the currency. Then it will create increased demand for the currency, so that market participants do this by buying pounds and selling other currencies. These events can be seen in the figure below : the pound currency sales events will encourage the supply curve to the right (S1 to S2) and force the exchange rate down.

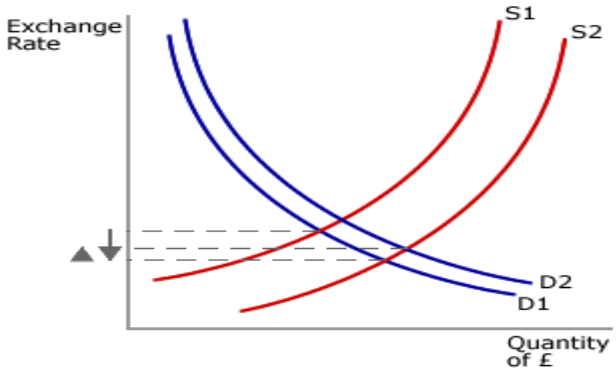

Figure 5: Graph the market intervention by government

In the events as described above, the government will carry out an action by selling the currency (perhaps the dollar, euro or yen) and buy a pound in the currency market. This can create an increasing demand for the currency pounds, boosting the demand curve D2. Pound Currency exchange rates are going to fall slowly, but the actions taken by the government has been able to make the currency exchange rate pound fall slowly. Conversely, when the value of the pound to rise, then the government will have intervened by buying foreign currency and selling the pound which is owned. This action may cause the supply of pounds and can help slow the appreciation of the exchange rate of the currency.

Theory 4 - Effects of exchange rate changes

The increase and decrease in the exchange rate of the currency of a country could cause significant impact to the economy. As the following example: If the exchange rate of a currency in a country experiencing a significant decline it could lead to a change in price relative to the value of imports and exports. The possibility of the value of exports will be much reduced compared to the exchange rate of other currencies, while the value of imports will rise more expensive. This is where the cause of inflation in a country, or even vice versa for example the same case can be deflation.

In the image below we may be seeing a shift in aggregate demand (AD1 to AD-2) draw up price levels occur.

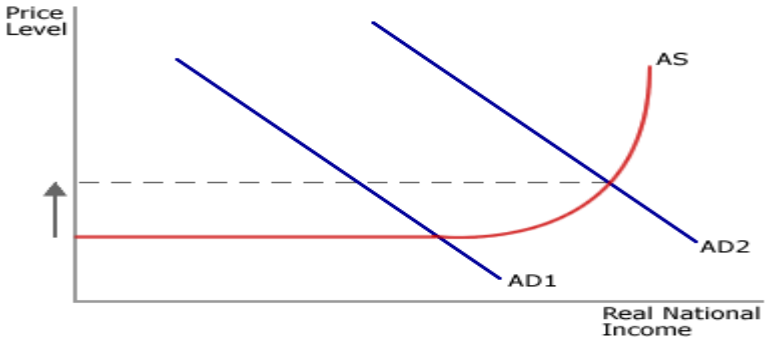

Figure 6. Graph of changes in currency exchange rates

Over the long-term impact of the decline in the exchange rate on the balance of payments nearing definitely worth it depends on how big the changes will be demand for imports and exports. It

depends on the elasticity of demand for imports and exports. When the exchange rate falls imports get more expensive and exports cheaper.

To describe it, for example : the exchange rate between £ and € £ 1 = € 2. Prices of goods, X, in the UK is £ 5. The value exchange rate at that time to 100 products to be purchased from abroad will make the entry - export earnings of £ 500. While separately a product Y in European countries are rewarded € 5, those products in the UK when purchased will be rewarded in proportion to 200 at the current exchange rate. The conclusion that we would experience a loss of £ 2.50 for each unit purchase the product. So that the total value of expenditures on imports will be £ 500. At the same time, the balance of payments will be at position 0.

So let us look at the impact of the occurrence of an actual demand for imports and exports are given two different scenarios in the chart below.

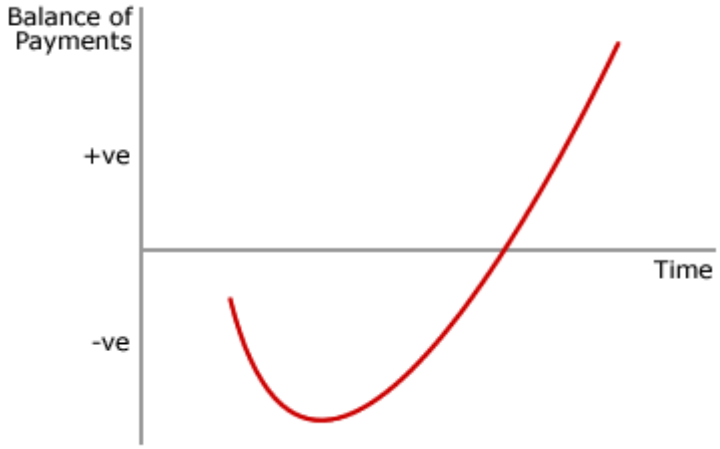

Figure 7: Graph balance of payment within the time scale

The incident occurred because it takes time for changes in the exchange rate into account by decision makers.

Theory 5 - Exchange rate jargon

There are several terms used, relating to the exchange rate. In this section we can see some of these terms and will know what it means.

Place Exchange Rates

Usually for this case is called the spot rate, or in other words the exchange rate occur at levels that are on the market at any given moment. This incident can be said that the exchange rate can be interpreted as a currency for immediate delivery. The value in spot rate will change according to the change of the supply and demand for the currency in the market.

The exchange rate ahead

The purpose of the forward exchange rate is a price level of the exchange rate for a specific time in the future. Usually, many companies use forward exchange market to protect themselves against the impending risk of a currency exchange rate. They know they can buy at a rate guaranteed for the future, and so it can plan ahead. Usually this is called 'hedging' against a risk of currency values. The existence of developed markets could also create a potential for the occurrence of speculation. All of it depends on the reason whether consumers will buy or sell the currency to the dealer, could end up better or worse.

Purchasing Power Parity

The process of purchasing power parity exchange rate is the exchange rate between two currencies, which will allow exactly the same basket of goods to be purchased. Or in other words, the rate at which the purchasing power will be the same in both countries could occur. For example, a basket of goods in the amount of $ 50 purchase in the United States, and one basket that is equal to the amount of purchase £ 25 in the UK. The occurrence of a PPP where the rate between £ and $ it will be £ 1 = $ 2.

Variables Used and Methodology

Time & Data Research

The research was conducted by the author during the months of August - October 2015. The data used in this research is data exchange rates that exist in the east and southeast asia against currency U $ D. Research Data used Data Stream data base Obtained from Bank Indonesia (BI), the Central Bureau of statistics (BPS) and from other sources Blomberg example during the period January 1, 2004 to December 31, 2014.

Variables & Model

Variables used in the study is the currency exchange rate in the east and southeast asia against the dollar in the united states asymmetrics, using

several models econometric approach. This study aimed to identify empirically the use of econometric methods of analysis in currency exchange rates, particularly in the area east and southeast asia. Thus the model to be estimated as follows:
IDR = F (H$K, JPN, WON, YUAN, BRUNEI$, RINGGIT, BATH, SNG$, PESO)

Because the data analysis framework as stationary, Cointegration, VAR, ECM, VECM and ARDL can be used for the estimation of the empirical model above.

Methodology

The first method in the analysis of time series that many in doing that stationarity test. Series called for a non-stationary if the mean, variance, and autocovariance time keeps changing with time.

The Augmented Dickey-Fuller Test

Depending upon the nature of the time series it may be represented as in the equation (1) or equation (2) or equation (3).

$$\Delta Yt=\delta Y_{t-1}+ut \quad \text{... (1)}$$

$$\Delta Yt=\beta_1 +\delta Y_{t-1}+ut \quad \text{... (2)}$$

$$\Delta Yt=\beta_1 +\beta_2 t+\delta Y_{t-1}+ut \quad \text{... (3)}$$

The Augmented Dicky Fuller (ADF) test under the null of non stationarity can be conducted to test whether a given series is stationary or not. This test is conducted by augmenting either of the above three equations by adding the lagged value of the dependent variable ΔYt . Thus each of the above equation will be as follows:

$$\Delta Yt=\delta Y_{t-1}+\sum_{i=1}^{m}\alpha_i \Delta Y_{t-i}+et \quad \text{... (4)}$$

$$\Delta Yt=\beta_1 +\delta Y_{t-1}+\sum_{i=1}^{m}\alpha_i \Delta Y_{t-i}+et \quad \text{... (5)}$$

$$\Delta Yt=\beta_1 +\beta_2 t+\delta Y_{t-1}+\sum_{i=1}^{m}\alpha_i \Delta Y_{t-i}+et \quad \text{... (6)}$$

Where e_t is a pure white noise error, and the number of lagged difference term to include is determined empirically (Gujarati, 2005). In each of the above equations if δ=0 the series is non stationary. The Dicky Fuller tables can be used to test the significance of the hypothesis.

Cointegration test

There are two models for testing Cointegration popular in the analysis of economic data, namely:
1. The method of Engle Granger (1987)
2. The method of Johansen and Juselius (1990)

This study uses a methodology Johanson maximum likelihood method to estimate the cointegrating relationships in multivariate systems. So, if Y vectors have n time series, each of which is I (1) and if the vector can be expressed as

$$y_t=\pi 1 y_{t-1}+....\pi k y_{t-k}+\varepsilon t \quad (7)$$

where, π_1 are NxN matrices of unknown constants and the error term ε_t has the multivariate normal distribution N(0, Σ). The equation (7) can be converted into the following equation:-

$$\Delta y_t= \Gamma 1 \Delta y_{t-1}+....+ \Gamma k-1 \Delta y_{t-k+1}+\pi \Delta y_{t-k}+\varepsilon t \quad (8)$$

Johansen (1988) , Johansen and Juselius (1990), shows that the rank of π r in equation (8) is equal to the number of cointegrating vectors in the system (Nachane, 2006).

Error Correction Model

The existence of a process of data analysis Cointegration is an analysis of the data to see how the

variables can be viewed as a long-term relationship. In Engle and Granger (1987), shows that the balance of the specification can occur when variables in the analysis do cointegrated have felt represented in vector Autoregression specifications, but with the pace imbalance makes the explanation that the variables in the model must be determined. Usually this model is called the error correction model, because this model has a self-regulating mechanism in which the deviation from the long-term equilibrium may occur after the automatic correction (Shivam & Jayadev, 2004).

Vector Error Corection Model

VECM offers the possibility to apply vector autoregressive model (VAR) integrated multivariate time series. In some lessons they provide labels such as some problems in applying VAR for a unified series, but the important thing is how much the regression false or commonly called (t-statistics are very significant and R ^ 2 high even though there is no correlation between the variables).

To make the model VECM in need of the following three steps: first do the specification and estimation of the VAR model for integrated multivariate time series, which both Calculating likelihood ratio test to determine the amount of cointegration relationship and latter determines the amount cointegrations.

Autoregression Distributed Lags

"ARDL" stands for "Autoregressive-Distributed Lag". Data analysis model has been widely used for decades, it has been proven that the current model of ARDL can provide proof of vehicle testing for the presence of long-term relationships between economic time series data.

Meanwhile, ARDL regression model can be seen as follows:

$$y_t = \beta_0 + \beta_1 y_{t-1} + \text{.....} + \beta p y_{t-p} + \alpha_0 x_t + \alpha_1 x_{t-1} + \alpha_2 x_{t-2} + \text{.....} + \alpha_q x_{t-q} + \varepsilon_t$$

where ε_t is a random "disturbance" term.

Model "autoregressive", in the sense that Yt "described (in part) by the lagged values of it self. It also has a component of "distributed inside lag", in the form of successive delays variable explanation" X ". Sometimes, the current value xt it self excluded from the distributed lag model is structured.

Results of Empirical Estimation

Several stages of data analysis and regression model done to answer these results:

I. stationarity tests on data using the ADF test.
II. Cointegrated system by using Cointegration test.
III. To estimate the ECM model equations error correction mechanism.
IV. Testing VECM using VECM Model Test.
V. To estimate ARDL test models Autoregressive model with distributed lags.

Stationerity test

From table 1 below clearly that all the variables under study are non-stationary in levels of alpha that is in use and stationary in differences:

Table 1. Result test of unit root

Foreight Exchanga	Max Lags	ADF Test	1% Level	Value Prob.	Condition
D(CHINA_YUAN)	axlag=27	-52.21675	-3.432592	0.0001	Stationerity
D(HONGKONG_$)	axlag=27	-20.15129	-3.432605	0.0001	Stationerity
D(INDONESIA_RUPIAH)	axlag=27	-10.60408	-3.432608	0.0000	Stationerity
D(JAPAN_YEN)	axlag=27	-52.34069	-3.432592	0.0001	Stationerity
D(KOREAN_WON)	axlag=27	-10.76599	-3.432616	0.0000	Stationerity
D(MALAYSIA_RINGGIT)	axlag=27	-13.31260	-3.432604	0.0000	Stationerity
D(PHILIPPINE_PESO)	axlag=27	-12.68359	-3.432611	0.0000	Stationerity
D(SINGAPORE_$)	axlag=27	-11.84561	-3.432610	0.0000	Stationerity
D(THAI_BAHT)	axlag=27	-9.521975	-3.432617	0.0000	Stationerity
D(BRUNEI_$)	axlag=27	-34.51664	-3.432594	0.0000	Stationerity

*Sources proceed by author

Because of all the variables that are found to be stationary at the level using the ADF test, and a stationary process occurs for all variables, so Cointegration further testing can be done on the data. However, before the test for Cointegration, on the need to look at the level of lags in use in the ADF test.

Cointegration test

Some tests must be done before the application of cointegration tests conducted, assumptions must be made about the presence of a deterministic trend in the data, for example. Cointegration test is repeated with or without allowing for linear trend in the data, and the results

can be shown in the number of cointegration vectors that exist at the output. Look to the model equations are made, the results of cointegration test using unit root in get the following results:

Table 2 . Result Cointegration Test

Series: BRUNEI_$ CHINA_YUAN HONGKONG_$ PHILIPPINE_PESO MALAYSIA_RINGGIT KOREAN_WON JAPAN_YEN INDONESIA_RUPIAH SINGAPORE_$ THAI_BAHT				
Lags interval (in first differences): 1 to 2				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.255029	1275.046	239.2354	0.0001
At most 1 *	0.078047	484.5549	197.3709	0.0001
At most 2 *	0.032990	266.3700	159.5297	0.0000
At most 3 *	0.022549	176.2985	125.6154	0.0000
At most 4 *	0.014301	115.0625	95.75366	0.0012
At most 5 *	0.010971	76.38846	69.81889	0.0136
At most 6	0.008868	46.76990	47.85613	0.0630
At most 7	0.005090	22.85438	29.79707	0.2533
At most 8	0.003321	9.153924	15.49471	0.3514
At most 9	8.30E-05	0.222800	3.841466	0.6369
Trace test indicates 6 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

*Sources proceed by author

On the results of the above output, using a significance level used turned out to trace the statistical value much greater than the critical value at the level of confidence being used, so it can be concluded that many variables between mutually cointegrated. If we see there are six variables are mutually cointegrated with a confidence level of 5%. Thus in this study accept that there are six variables are mutually cointegrated exchange rate, while the rest do not.

Statistically coefficient ut-1 is very significant, this indicates that the error can be said to affect the balance of variable currency exchange rates. This may imply that the rupiah exchange rate to adjust to the changes in exchange rates in other Asian currencies during the same period. Or in other words, can we explain the adjustment of the exchange rate to adjust the Asian region in the next period to get the balance of the long term it is so meaningful, because the coefficient of 5%

If we look again at the above output results also provide information that short-term changes to the currency exchange rate asian region has a positive impact on short-term changes in the exchange rate. Thus the results of the study received a given hypothesis, which says that the exchange rate cointegrated Asian region over the long term and adjust in the short term.

VECM Model

We must use VECM if variable 1) non-stationary and 2) find a general trend among the variables (Cointegration). If the previous tests are assumptions no.2 and no.1 assumptions are met, in other words VECM models can proceed.

ECM Model

Statistically, cointegration vector is not defined individually, only the space spanned by these vectors which are described by the test results. Thus, to identify the individual cointegration equation, cointegration vector should be normalized. Usually the relationship between the exchange rate variable region economically asia macro to do the examination and be a normalization process by using test Error Correction Estimate. Here we can see for ECM test results on currency exchange rates at the east and southeast asia region:

Table 3 . Result ECM Model

Dependent Variable: D(INDONESIA_RUPIAH)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CHINA_YUAN)	-10453.79	4.670011	-2.240014	0.0000
D(HONGKONG_$)	4561.059	1.730011	2.630014	0.0000
D(JAPAN_YEN)	-49.63122	3.240013	-1.530014	0.0000
D(KOREAN_WON)	-14.84298	5.580014	-2.660014	0.0000
D(MALAYSIA_RINGGIT)	-972.3277	1.240011	-7.840013	0.0000
D(PHILIPPINE_PESO)	226.0981	8.830013	2.560014	0.0000
D(SINGAPORE_$)	42131.85	1.410010	2.980014	0.0000
D(THAI_BAHT)	-114.0409	7.640013	-1.490014	0.0000
D(BRUNEI_$)	2391.109	4.530011	5.270013	0.0000
D(RESID01)	10453.79	3.510011	2.980014	0.0000
C	-3.45E-15	1.950013	-0.017681	0.9859
R-squared	1.000000	Mean dependent var		-1.438779
Adjusted R-squared	1.000000	S.D. dependent var		64.41712
S.E. of regression	1.000011	Akaike info criterion		-47.81232
Sum squared resid	2.680019	Schwarz criterion		-47.78819
Log likelihood	64246.86	Hannan-Quinn criter.		-47.80359
F-statistic	1.110028	Durbin-Watson stat		2.934805
Prob(F-statistic)	0.000000			

*Sources proceed by author

Table 4. Result VECM Model

Vector Error Correction Estimates										
Cointegrating Eq:	CointEq1									
BRUNEI_$(-1)	1.000000									
CHN_YN(-1)	-0.000108	HKG_$(-1)	-0.001846	IND_IDR(-1)	-1.690007	JPN_YEN(-1)	1.640005			
	(0.00070)		(0.00330)		(1.40007)		(1.20005)			
	[-0.15372]		[-0.55882]		[-1.19527]		[1.34928]			
KRAN_WON(-1)	1.310006	MYS_RGT(-1)	-0.000493	PLP_PSO(-1)	6.430005	SGD_$(-1)	-1.000035			
	(1.40006)		(0.00126)		(4.90005)		(0.00389)			
	[0.92967]		[-0.39171]		[1.30208]		[-257.317]			
THAI_BAHT(-1)	-3.910005									
	(8.90005)									
	[-0.43863]									
C	0.013779									
Error Correction:	BNEI_$)	D(CHN_YN)	D(HKG_$)	D(IND_IDR)	D(JPN_YEN)	D(KRN_WON)	D(MLS_RGT)	D(PLP_PSO)	D(SINGAPORE_$)	D(THAI_BAHT)
CointEq1	-0.927065	0.019353	0.086101	327.8219	-0.903644	-42.22227	-0.036867	-1.553711	0.084219	0.595983
	(0.06327)	(0.07060)	(0.20752)	(704.359)	(7.19810)	(102.185)	(0.19143)	(4.34920)	(0.05324)	(2.81906)
	[-14.6534]	[0.27412]	[0.41491]	[0.46542]	[-0.12554]	[-0.41319]	[-0.19259]	[-0.35724]	[1.58196]	[0.21141]
D(BRUNEI_$(-1))	-0.015635	-0.025362	-0.047736	-147.5075	-1.677069	31.43837	0.043293	0.726650	-0.022743	0.563232
	(0.05163)	(0.05762)	(0.16935)	(574.825)	(5.87434)	(83.3929)	(0.15623)	(3.54937)	(0.04345)	(2.30062)
	[-0.30282]	[-0.44020]	[-0.28187]	[-0.25661]	[-0.28549]	[0.37699]	[0.27711]	[0.20473]	[-0.52346]	[0.24482]
D(BRUNEI_$(-2))	-0.041794	-0.005026	-0.034705	-94.02570	-4.088556	31.70070	0.014441	-0.004273	-0.047079	-0.573197
	(0.03646)	(0.04069)	(0.11961)	(405.969)	(4.14875)	(58.8962)	(0.11034)	(2.50674)	(0.03068)	(1.62481)
	[-1.14614]	[-0.12351]	[-0.29016]	[-0.23161]	[-0.98549]	[0.53825]	[0.13088]	[-0.00170]	[-1.53431]	[-0.35278]
D(CHINA_YUAN(-1))	0.026615	-0.007449	-0.124439	262.6861	-2.814226	-60.16473	0.093376	1.955379	0.023614	-1.899026
	(0.01764)	(0.01968)	(0.05786)	(196.386)	(2.00694)	(28.4907)	(0.05337)	(1.21262)	(0.01484)	(0.78599)
	[1.50880]	[-0.37843]	[-2.15074]	[1.33760]	[-1.40225]	[-2.11173]	[1.74946]	[1.61252]	[1.59085]	[-2.41608]
D(CHINA_YUAN(-2))	-0.034437	-0.012374	-0.002097	-193.7775	0.759025	12.55409	-0.045941	1.160868	-0.031320	-0.347309
	(0.01772)	(0.01977)	(0.05811)	(197.235)	(2.01562)	(28.6140)	(0.05361)	(1.21787)	(0.01491)	(0.78940)
	[-1.94385]	[-0.62593]	[-0.03608]	[-0.98247]	[0.37657]	[0.43874]	[-0.85701]	[0.95320]	[-2.10093]	[-0.43997]

D(HONGKONG_$(-1))	-0.004587	0.004077	-0.656439	-103.8755	-1.222679	0.645879	-0.002199	0.385575	-0.003648	-0.146732
	(0.00559)	(0.00624)	(0.01834)	(62.2665)	(0.63632)	(9.03334)	(0.01692)	(0.38448)	(0.00471)	(0.24921)
	[-0.82020]	[0.65319]	[-35.7834]	[-1.66824]	[-1.92147]	[0.07150]	[-0.12995]	[1.00286]	[-0.77511]	[-0.58879]
D(HONGKONG_$(-2))	-0.002029	0.000325	-0.324808	-30.18241	-0.707914	1.139023	-0.001606	0.425319	-0.001415	-0.089940
	(0.00559)	(0.00624)	(0.01835)	(62.2677)	(0.63634)	(9.03352)	(0.01692)	(0.38448)	(0.00471)	(0.24921)
	[-0.36282]	[0.05207]	[-17.7054]	[-0.48472]	[-1.11248]	[0.12609]	[-0.09488]	[1.10621]	[-0.30065]	[-0.36089]
D(INDONESIA_RUPIAH(-1))	-8.530007	3.390007	-4.740006	-0.058246	-0.000831	-0.019528	1.190005	0.000115	-1.140006	0.000120
	(1.90006)	(2.20006)	(6.40006)	(0.02162)	(0.00022)	(0.00314)	(5.90006)	(0.00013)	(1.60006)	(8.70005)
	[-0.43945]	[0.15652]	[-0.74464]	[-2.69391]	[-3.75924]	[-6.22545]	[2.02388]	[0.86135]	[-0.69659]	[1.38433]
D(INDONESIA_RUPIAH(-2))	3.140006	8.060007	1.060006	-0.033227	0.000173	0.005377	1.770005	0.000103	3.170006	0.000166
	(2.00006)	(2.20006)	(6.40006)	(0.02182)	(0.00022)	(0.00317)	(5.90006)	(0.00013)	(1.60006)	(8.70005)
	[1.60430]	[0.36854]	[0.16477]	[-1.52247]	[0.77556]	[1.69839]	[2.97661]	[0.76738]	[1.91940]	[1.90608]
D(JAPAN_YEN(-1))	0.000105	-3.970005	0.001031	5.656336	-0.034882	0.577219	-0.000758	0.004224	3.950005	0.008586
	(0.00018)	(0.00020)	(0.00059)	(1.99196)	(0.02036)	(0.28899)	(0.00054)	(0.01230)	(0.00015)	(0.00797)
	[0.58620]	[-0.19882]	[1.75629]	[2.83958]	[-1.71356]	[1.99740]	[-1.40088]	[0.34338]	[0.26211]	[1.07698]
D(JAPAN_YEN(-2))	0.000154	-0.000237	7.330005	2.665630	-0.014066	-0.591609	-0.000738	-0.018156	7.250006	0.013799
	(0.00018)	(0.00020)	(0.00058)	(1.97459)	(0.02018)	(0.28647)	(0.00054)	(0.01219)	(0.00015)	(0.00790)
	[0.86705]	[-1.19989]	[0.12607]	[1.34996]	[-0.69706]	[-2.06521]	[-1.37535]	[-1.48912]	[0.04855]	[1.74602]
D(KOREAN_WON(1))	-5.010007	2.070005	1.070005	-0.160151	0.001372	0.098471	8.920005	0.000272	-2.850006	-7.590005
	(1.30005)	(1.40005)	(4.10005)	(0.14008)	(0.00143)	(0.02032)	(3.80005)	(0.00086)	(1.10005)	(0.00056)
	[-0.03981]	[1.47255]	[0.25889]	[-1.14331]	[0.95839]	[4.84562]	[2.34180]	[0.31420]	[-0.26923]	[-0.13543]
D(KOREAN_WON(2))	-3.460006	1.850005	-3.110005	-0.032464	0.001687	-0.050748	5.640005	0.000790	-3.410007	-0.000318
	(1.20005)	(1.40005)	(4.10005)	(0.13872)	(0.00142)	(0.02012)	(3.80005)	(0.00086)	(1.00005)	(0.00056)
	[-0.27734]	[1.32899]	[-0.76090]	[-0.23403]	[1.18998]	[-2.52168]	[1.49644]	[0.92221]	[-0.03252]	[-0.57208]
D(MALAYSIA_RINGGIT(-1))	0.017317	0.001393	0.011638	162.4235	-0.958763	24.66474	-0.394932	0.812344	0.020222	0.377643
	(0.00734)	(0.00819)	(0.02409)	(81.7590)	(0.83553)	(11.8612)	(0.02222)	(0.50484)	(0.00618)	(0.32722)
	[2.35809]	[0.16996]	[0.48316]	[1.98661]	[-1.14750]	[2.07944]	[-17.7731]	[1.60912]	[3.27238]	[1.15408]
D(MALAYSIA_RINGGIT(-2))	0.002939	0.000818	0.011557	318.2153	-1.367505	-0.127172	-0.140448	1.094915	0.005939	0.176999
	(0.00736)	(0.00821)	(0.02414)	(81.9238)	(0.83721)	(11.8851)	(0.02227)	(0.50585)	(0.00619)	(0.32788)
	[0.39944]	[0.09959]	[0.47883]	[3.88428]	[-1.63341]	[-0.01070]	[-6.30788]	[2.16449]	[0.95919]	[0.53982]
D(PHILIPPINE_PESO(-1))	0.000470	-5.300005	-0.001186	4.092893	0.034944	0.010557	0.001331	-0.160463	0.000487	0.037044
	(0.00029)	(0.00032)	(0.00095)	(3.23181)	(0.03303)	(0.46886)	(0.00088)	(0.01996)	(0.00024)	(0.01293)
	[1.61813]	[-0.16361]	[-1.24518]	[1.26644]	[1.05805]	[0.02252]	[1.51488]	[-8.04107]	[1.99482]	[2.86394]
D(PHILIPPINE_PESO(-2))	-9.080005	-0.000892	-0.000926	0.023449	0.021287	0.083521	0.000565	-0.177445	-0.000105	0.032883
	(0.00029)	(0.00032)	(0.00095)	(3.23384)	(0.03305)	(0.46915)	(0.00088)	(0.01997)	(0.00024)	(0.01294)
	[-0.31259]	[-2.75306]	[-0.97205]	[0.00725]	[0.64412]	[0.17803]	[0.64235]	[-8.88649]	[-0.42917]	[2.54063]
D(SINGAPORE_$(-1))	-0.035437	-0.019696	0.212810	-657.8491	16.36469	41.07806	0.490934	0.620271	-0.031857	5.406057
	(0.05926)	(0.06613)	(0.19438)	(659.760)	(6.74232)	(95.7149)	(0.17931)	(4.07381)	(0.04987)	(2.64056)
	[-0.59800]	[-0.29784]	[1.09483]	[-0.99710]	[2.42716]	[0.42917]	[2.73787]	[0.15226]	[-0.63884]	[2.04731]
D(SINGAPORE_$(-2))	0.027327	-0.007632	0.045946	-600.5223	7.010455	58.18086	0.148431	-0.100429	0.007722	2.893265
	(0.04616)	(0.05151)	(0.15142)	(513.952)	(5.25226)	(74.5618)	(0.13968)	(3.17349)	(0.03885)	(2.05699)
	[0.59197]	[-0.14815]	[0.30344]	[-1.16844]	[1.33475]	[0.78030]	[1.06262]	[-0.03165]	[0.19878]	[1.40655]
D(THAI_BAHT(-1))	1.750005	0.000337	-0.000332	0.777151	0.048840	-0.513539	0.000126	-0.022995	0.000109	-0.608413
	(0.00042)	(0.00047)	(0.00137)	(4.65623)	(0.04758)	(0.67550)	(0.00127)	(0.02875)	(0.00035)	(0.01864)
	[0.04191]	[0.72303]	[-0.24194]	[0.16691]	[1.02640]	[-0.76023]	[0.09974]	[-0.79981]	[0.30927]	[-32.6478]
D(THAI_BAHT(-2))	0.000263	-5.960005	-0.000938	7.678113	-0.139305	-0.418041	0.001970	0.007627	0.000348	-0.372525
	(0.00042)	(0.00046)	(0.00137)	(4.63661)	(0.04738)	(0.67266)	(0.00126)	(0.02863)	(0.00035)	(0.01856)
	[0.63252]	[-0.12827]	[-0.68679]	[1.65597]	[-2.93996]	[-0.62148]	[1.56303]	[0.26639]	[0.99170]	[-20.0745]
C	0.000152	0.000829	0.000101	-1.463727	-0.007023	0.024016	5.740005	0.003055	0.000154	0.005697
	(0.00011)	(0.00013)	(0.00037)	(1.25925)	(0.01287)	(0.18269)	(0.00034)	(0.00778)	(9.50005)	(0.00504)
	[1.34618]	[6.57089]	[0.27258]	[-1.16238]	[-0.54573]	[0.13146]	[0.16779]	[0.39295]	[1.61423]	[1.13038]
R-squared	0.206135	0.006525	0.327848	0.019388	0.021551	0.034441	0.111196	0.050521	0.014148	0.305662

Adj. R-squared	0.199874	-0.001310	0.322547	0.011655	0.013835	0.026827	0.104187	0.043034	0.006374	0.300186
Sum sq. resids	0.088178	0.109802	0.948686	10929638	1141.441	230034.8	0.807333	416.7124	0.062438	175.0758
S.E. equation	0.005754	0.006421	0.018875	64.06448	0.654698	9.294182	0.017412	0.395578	0.004842	0.256406
F-statistic	32.92727	0.832823	61.85233	2.507136	2.793062	4.523226	15.86481	6.747466	1.819908	55.82411
Log likelihood	10049.90	9755.460	6860.492	-14968.11	-2661.490	-9784.713	7077.093	-1308.719	10513.31	-144.5339
Akaike AIC	-7.469569	-7.250249	-5.093849	11.16582	1.998875	7.304814	-5.255190	0.991225	-7.814753	0.124048
Schwarz SC	-7.421263	-7.201944	-5.045543	11.21412	2.047180	7.353119	-5.206885	1.039530	-7.766447	0.172353
Mean dependent	0.000136	0.000803	1.220005	-1.437616	-0.005162	0.031633	0.000113	0.004333	0.000136	0.002445
S.D. dependent	0.006433	0.006417	0.022932	64.44110	0.659275	9.421414	0.018396	0.404375	0.004858	0.306504
Determinant resid covariance (do adj.)		6.550019								
Determinant resid covariance		6.040019								
Log likelihood		18221.33								
Akaike information criterion		-13.40136								
Schwarz criterion		-12.89635								

*Sources proceed by author

VECM (or Vector Error Correction Model) is a derivative of the VAR method. Assuming that need to be filled the same as those in the VAR model, except the stationary problem. In contrast to the VAR, VECM must be stationary on the first differentiation and all variables must have the same stationary, are differentiated in the first instance. In the table we can see the value of AIC and SIC to amounted -13 401 and -12 896, almost all the variables was significant relationship with VECM models. So it can be concluded for data analysis in this study the changing balance of errors in variables in doing research in the long term will adjust his fault correction process, along with significant results for the relationship between variables.

ARDL Model

ARDL model is an of the data analysis popularized by Pesaran et al. (2001), to include the I (0) and I (1) variables in the same ballpark so that if the variables that we have stationary I (0), the OLS right and if all the free stationary I (1), so it is recommended to run VECM (Johanson approach) because many models are simple. Here we refer to test results ARDL :

Table 5. Result ARDL Model

Dependent Variable: BRUNEI_$(-1)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
CHINA_YUAN(-1)	0.003685	0.009468	0.389234	0.6971
HONGKONG_$(-1)	8.520005	0.002583	0.032967	0.9737
INDONESIA_RUPIAH(-1)	5.930007	1.030006	0.577182	0.5639
JAPAN_YEN(-1)	0.000110	9.430005	1.164108	0.2445
KOREAN_WON(-1)	3.740006	6.600006	0.566592	0.5710
MALAYSIA_RINGGIT(-1)	0.003549	0.003668	0.967568	0.3333
PHILIPPINE_PESO(-1)	5.220005	0.000154	0.338245	0.7352
SINGAPORE_$(-1)	0.958594	0.015873	60.39308	0.0000
THAI_BAHT(-1)	7.110005	0.000202	0.351839	0.7250
BRUNEI_$	-0.002591	0.019348	-0.133936	0.8935
CHINA_YUAN	-0.003551	0.009438	-0.376234	0.7068
HONGKONG_$	4.600007	0.002582	0.000178	0.9999
INDONESIA_RUPIAH	-4.690007	1.030006	-0.456166	0.6483
JAPAN_YEN	-0.000121	9.410005	-1.285619	0.1987
KOREAN_WON	-4.630006	6.660006	-0.695092	0.4871
MALAYSIA_RINGGIT	-0.003366	0.003665	-0.918390	0.3585
PHILIPPINE_PESO	-0.000128	0.000154	-0.830079	0.4066
SINGAPORE_$	0.043986	0.024872	1.768522	0.0771
THAI_BAHT	-7.750006	0.000203	-0.038154	0.9696
R-squared	0.999650	Mean dependent var		1.427608
Adjusted R-squared	0.999648	S.D. dependent var		0.162793
S.E. of regression	0.003056	Akaike info criterion		-8.736174
Sum squared resid	0.024922	Schwarz criterion		-8.694482
Log likelihood	11756.05	Hannan-Quinn criter.		-8.721093
Durbin-Watson stat	1.998797			

*Sources proceed by author

In an event when the value of Y and X are stationary and cointegrated, it will produce a good regression. ARDL so that the model can be used. If we see from the results above display output, obtain it looks at the long-term effects of changes in the exchange rate variable that is in use. It concluded that in the long term between the exchange rate for the model that created ARDL k = -0 / p = - (31.67 / -12.38) = - 2:56. If we see if there is a constant change in the form of changes in currency exchange rates one of the country by 1%, then the value of currency of one country will again be decreased by 2:56%.

Conclusion

From the research that has been done can be concluded that the data exchange rates in the region east and southeast asia is stationary, for 6 variables from 10 variables exchange rate used cointegrated in the long term, and with a model of ECM are applied exchange rate currency in the short term have a positive impact of exchange against the dollar the United States, with a model VECM almost entirely variable benefit significantly corrected to do in the short term as well as with models ARDL the changes that occur in the short term and in the long term by 1%, then it will have changes in decline in the exchange rate of 2:56%. So that the econometric models that created asymmetrics can explain how changes in currency exchange rates in the region east and southeast asia in the short term and long term, during the period of research data by the authors do it.

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