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STATIONERITY AND RELATIONSHIP BETWEEN THE FOREIGN EXCHANGE CASE STUDY IN EAST AND SOUTH ASIA

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Abstract: *The purpose of this study is to see how the conditions and the relationship between currency exchange rates come within East asia and South-East, against the United States dollar. Research data used Data Stream data base obtained from Bank Indonesia (BI), the Central Bureau of statistics (BPS) and from other sources during the period January 1984-2012. For the method of data analysis used in the study, the analysis of quantitative data to address research hypotheses. This study uses several methods of analysis of research data among them, test stasioneritas, Granger Causality Test and test the ECM.*

From the research that has been done can be concluded that currency exchange ratescome within East asia and South-East, have data that is stationary and only exchange rates affect currencies come within East asia and southeast asia significantly are : Hongkong dollar t-1, and china's yuan in t-1, while others not too affect. In the long-term there are 6 variables that influence each other, while the rest did not. The process of ECM can deduce the currency exchange rates come within asia are experiencing an adjustment next period to reach long-term balance, but interbank exchange rates most ties in one direction is not two-way.

Originality of research namely in Indonesia is the first research was conducted to analyze the exchange rates come within East asia and south east asia, which included a variable exchange rate of Rupiah into the model analysis research.

Keywords: *exchange rate, Stasioneritas, Causality, Granger, Error correction model.*

Jel Classification: *C39, C01, B49*

1. INTRODUCTION

On June 6, 2015 rupiah exchange rate weakened briefly to touch the recorded level 13.297 per U.S. dollar, and not moving up to 13,000 per U.S. dollar level. One day before nearly happened also the weakening of the exchange rate of the rupiah weakened even more sharply, up to the level of 13.300 per U.S. dollar. This is the highest value at the beginning of this week, the weakening had almost touched the level of 8-10 per cent of the level of the previous level. It was made rupiah currency is the currency that are experiencing weakening exchange rates highest in the Asian region in particular.

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From some of the data reported by Bloomberg, according to the exchange rate of the rupiah are experiencing weakening 0.05 per cent to as low as 13.288 per U.S. dollar after weakening earlier closed in 13.281 level per U.S. dollar in earlier trading. However in the early trading session, the exchange rate of the rupiah still fluctuates weakeningin the us dollar per 13.277 range until 13.297 per U.S. dollar, it is almost constantlyhappens every day, so did the value of the currencies of other Asian countries. It should be noted, the most frequent exchange rate depreciate only dollars, the value of currencies in other Asian countries, it is not. They also depreciate, but not as big asthe exchange rate of the rupiah against the U.S. dollar.

The majority of analysts Bloomberg surveyed even said, the rupiah could weakenmore severe to the range of 13,500 per U.S. dollar at the end of the year. The figure is the lowest level in the last 17 years since August 1998, where in that time Indonesiahit by the financial crisis that prompted the community lose former President Suhartofrom Office. An alert from the Reuters page, the weakening of the rupiah that is happening more caused due to weakening domestic economic growth and the highinflation rate in the country. Even so, the Bank Indonesia (BI) as Indonesia's monetary regulators have to do the intervention in order to protect the rupiah from weakening occurred further to the level of unwanted number.

Actually in Asia and there are approximately 18 countries, where to the 18 countries that have or are using different currencies. These countries include the Asia South-East and East, with the current exchange value and measure the value of the highestfractions against the u.s. dollar. Timor Leste country-specific author do not enter datainto this research, due to their use of the us dollar, although they also had its owncurrency that is its function only as centavos monetary unit under us dollars (almost the same as cents). The author uses only 11 types of currencies from 18 countries who are in East and southeast asia, where if we mentioned countries used its currency exchange rate data in East and southeast asia region, namely Indonesia Rupiah, Won by South Korea, Japan Yen, Philippine Peso, Baht Thailand, Renminbi People's Republic of China, Malaysia, Ringgit Brunei Darrusalam Dollars , Singapore Dollars, Hong Kong Dollars.

If we see from a number of data used, the Indonesian State exists in the first place as the lowest value currency in Southeast Asia and the East. While Brunei and Singapore dollar value is the same because both these currencies in-use (its value is tied to each other). As for the value of the Singapore dollar in high value is consider the most because gross domestic product is higher than Singapore Brunei Darrusalam (Singapore GDP: US $ 194,918 billion; Brunei Darrusalam GDP: US $ 17,092 billion).

2. LITERATURE REVIEW

In terms of exchange rates, usually a lot of authors linking exchange rate problems with the theory of the power of purchasing power (PPP), in which the theory has

one of the oldest hypothesis in economics, and is one of the most widely tested hypothesis. For the problem of hypothesis is usually the price level in both countries is expressed in the same currency, in this case the author is using the dollar as the standard measure for determining the exchange rate fundamentals. Because PPP is the hypothesis that common and most widely used when examine when concerning exchange rates. It should be also noted that many empirical validity over the controversy regarding the truth of the theory of PPP. Some empirical research concerning PPP undertaken in developed and developing countries have many do the documentation of evidence both in favour and against the PPP theory.

Holmes (2001) argues that prices in many countries moving towards equality in terms of the common currency but in terms of potential interest to policy makers mainly indeveloping countries for at least two sockets of an underlying. The first reason, the PPP exchange rate prediction for the model and the criteria to assess the strengths and weaknesses of a country's currency value. If we see the sense of this highly relevant for the countries of Asia that its currency is often affected by a seriousfinancial crisis. The second reason, the number theory of exchange rates that often utilize some notion of PPP in the building of a new model. For the long term capacity of PPP is the assumption that the standard, but it is important to see that the moderntheory of exchange rates and macroeconomic context in the open was legitimate only.

Other empirical theory model in gagas by Liu and Burkett (1995), which they considera large number of empirical and theoretical model of exchange rate behaviour has been built around the PPP. Thus, the reliability of the advice policy based on these theories may depend on assumptions and ways of working mechanisms of PPP. Frootand Rogoff (1995) holds if in connection with the process of terkointegrasi, then the PPP holds the central role, where the real exchange rate, according to PPP theory asdevotees and not driven by stochastic trend. But the debate around it stasioneritas the real exchange rate, where the PPP will not hold continuously, and may not apply even in a long time. Some of the research conducted by Mc Nown and Wallace (1989) Bahmani-Oskooee (1993), Baharumshah and Till (1999), Chinn (2000) and Azali et al. (2000) which coincided with Wu (1996), Oh (1996), Papell (1997 & 2002) that verifies the relationship predicted by the PPP for the developing countries and the industrialized countries. If the overall conclusions drawn from the study, empirical evidence obtained using either the univariate approach or panel to answer thehypotheses of research they do is a result of the research which coincided with a large number of research studies conducted in developed countries in particular.

Some models of research again performed by Bahami - Oskooee (1993), Gan (1991),Baharumshah and Till (1997), Aggarwal and Mougoue (1996) on the State of the country that became the Tiger Asia and ASEAN countries, Chinn (2000), Phylaktis and Kassimatis (1994), Fukuda and canoeing (1997), Lee (1999) found

that average PPP deflated rupiah, won, ringgit, Singapore dollar and peso (expressed against U.S.dollars). All the research concerns the exchange rate associated with the PPP theory, along with Liu (1992) by using the technique, which uses the johansen Granger samples of several countries in Latin America from the 1940s, 1950s until 1989.

In Rogoff, (1996); Lothian and Taylor, (1996), Engle, (1998), Caner and Kilian (1998) and Wu (1996), where in their research found the same thing, as Engle revealed thatthetest very stasioneritas needs to be done if we're going to do some research about the exchange rate, and could answer that question a country's exchange rate is concerned. For problems in the field of research on this subject has also developed, with consideration of the form data will be used, the length of time data as well as the merger of time-series with observations of the cross-section (the test panel unit root). A lot of test data test panel done research model this rate call, Papell and Theodoridis (1998), Frankel and Rose (1996) and Levin and Lin (1993), O'Connel (1998), Papell (1997) Azali *et al.* (2001), but all the research done on countries developing countries and industrialized countries. Where researchers use PPP as a guide as well as the denial of the existence of random walk model of analysis used against Asian countries especially Japan as currency guidelines for the Asian region.

This research is then expected to provide input and contributions in the literatureresearch on exchange rates. And don't forget the unit root test tests, tests of causality Granger, as well as other tests done to give better results as previous researchconducted by by Lin (1993) Im *et al.* (1995), Harris and Tzavalis (1999) and Breiitung (2000) which also includes some model tests study's for save the existing in economic development, which include floating period at this time. This research does not use the PPP hypothesis and theory in answering the research hypothesis.

3. RESEARCH METHODOLOGY

3.1. Research Data and Research Time

The data in this study using daily data sample period starting from January 1, 2004 to December 31, 2014, comprising 10 countries that exist in the region of East asia and southeast asia : Indonesia Rupiah, Won by South Korea, Japan Yen, Philippine Peso, Baht Thailand, Hong Kong dollar, Renminbi People's Republic of China, Malaysia, Ringgit Brunei Darrusalam Dollars, Singapore Dollars. While the author does this research time ranges from starting in February 2015-2015 Test. The author assumes that a span of 10 years data usage is assessed sufficient to describe an analysis of research data.

3.2. Test Stasioneritas

The data in the form of a time series model, the required examination test data over the variables under examination are stationary. The test stasioneritas is

intended toexhibit the characteristics of a time series do not change over time in terms of auto covariances are constant over time and have the autocorrelation between time. In a study conducted by Granger and Newbold (1974) concluded that each statistical inference obtained from regression used depending of the integration variables aredubious. It is common to model this test using a root unit.

Test the hypothesis to test the custom of statsioneritas in this research:

H0: Ppada data time series has a unit root

3.3. Test VAR Model

In Engle and Granger (1987), the purpose of the test is to determine whether Granger was a group of non-stationary series berkointegrasi or not. The presence of Granger's relationship is the basis of the specification of the VEC. As a result, if the vector is a variable Yt to cointegrated, there is a valid error correction representation of data. By using the Johansen (1991, 1995), to determine the number of vector Granger, is a representation of the VAR from Yt is as follows:

$$Y_t = A_1 Y_{t-1} + \ldots + A_p Y_{t-p} + BX_t + e_t$$

where is the vector of non-stationary I (1) variable of the model, it is deterministic, and the variable vector is the vector procedures innovations.

$$\Delta Y_t = \Pi Y_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \Delta Y_{t-i} + BX_t + e_t$$

Test hypotheses to test VAR in this research are:

Based on the test variable all non VAR influence significantly

3.4. Test Granger

A test of the hypothesis that, there is a statistically significant relationship between the exchange rate by testing the existence of a combination of the two series Granger ter. That is to say when the combination has a low order of integration-ESP. If I (0), this could indicate the relationship of the balance of the series are said to cointegrated. Intuitively, a test version of the multivariate test Johansen DF univariate form consider the reduced VAR of order p:

$$y_t = A_1 y_{t-1} + \ldots + A_p y_{t-p} + Bx_t + u_t$$

where is the k-vector I (1) variables, is a vector of n-deterministic trend, and is thevector of shocks. In this study data analysis techniques using Granger Johansen test.

In this study the author makes the hypothesis that:

If the ut stationary then the variable exchange rates between currencies in the Asian region are said to be terkointegrasi

3.5. Test Error Correction Model

Economically the existence of known cointegrated nonstasioner series, showed a relationship between the long-term balance of the independent variable. However despite the balance of long term, in the short term may just be between variables does not reach balance. With the genesis of that un wanted distinction, requires the existence of adjustment to do short - term balance correction towards long term calleda test of ECM.

Test Hypotheses to test the ECM in this research are:

In the research conducted there is variable between different currency exchange ratesin asia are said to be berkointegrasi in the long-term and adjust in the short-term.

3.6. Test of Causality

Granger (1969) argued that the causality test to determine how much the presentvalue of Y can be explained by past values of Y, with the presence of failed X can improve the explanation of causality. The shape of the regression used bivariat fromthis test is used as:

$$Y_t = a_o + \sum_{i=1}^{p} a_i Y_{t-i} + \sum_{i=1}^{p} \beta_i X_{t-i} + e_t$$

$$X_t = a_o + \sum_{i=1}^{p} a_i X_{t-i} + \sum_{i=1}^{p} \beta_i Y_{t-i} + u_\tau$$

By creating the second equation then the values left behind and lagged values ofvariable Y is reported with a shared hypothesis:

$$\beta_1 = \beta_2 = \beta_3 = \ldots = \beta_p = 0$$

The zero hypothesis is that X does not Granger cause-Y in the first and the regressionof Y does not Granger cause X in the regression.

4. EMPIRICAL RESULTS

4.1. Testing of Unit Roots

Method to test the stasioneritas of the series is the root of the test unit. Specifically, it is a test of the hypothesis that the zero series has a unit root (H0: series has a unitroot). If the series has a unit root, it is nonstasioner.

Visual examination of some of the variables used in the system illustrates that the series has a trend and developed from time to time, although sometimes it takes years for the series to return to the average of the variables (the variables appendix).

Table 1
Result test of unit root

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

**Sources:* proceed by author

Note the above output, the value of the ADF test statistic turns giving similar results, where the data rate for the currency in the region east asia and asia, is stationary, using max lag 27, and by using the rate of 1% level. Probabilistic value generated almost all significant, this indicates that the data exchange is stationary, so the research could proceed to the test model of the 2nd. So accept hypothesis on research.

4.2. Testing VAR

Having established that the series of my time and followed the theoretical framework analyzed in 4.1 result, the VAR model should be determined according to the number of cointegration equations to be identified. For this purpose, a variety of diagnostic tests applied to the OLS equation for some long lag. Each equation VAR system checked for serial autocorrelation in the residuals and structural stability. In particular, the table below gives the results for tests VAR:

Based on output above shows that the variables that influence the currency exchange rate region east asia and asia significantly are: Hongkong dollar t-1, and china yuan in t-1, while the other, but do not affect the general or hardly affect most major currency exchange region east asia and asia. R ^ 2 value is 99% and AIC values and SIC in the equation used is minus. It can be concluded that the data in this study is quite good, because the adjusted R ^ 2 value is high enough, but the value of AIC and SIC is low, but we can not conclude that the model equations used poorly. So that research results reject the hypothesis test for a VAR who says all the variables will be significant.

Table 2
Result VAR test
Vector Autoregression Estimates

	CHINA_ YUAN	*HONGKONG_ $*	*INDONESIA_ RUPIAH*	*JAPAN_ YEN*	*KOREAN_ WON*	*MALAYSIA_ RINGGIT*	*PHILIPPINE_ PESO*	*SINGAPORE_ $*		
CHINA_YUAN(-1)	1.000821	0.014346	3.573964	-0.031827	-7.779580	0.007607	0.361833	0.004716	-0.027325	0.004953
	(0.00145)	(0.00448)	(14.6525)	(0.15011)	(2.13133)	(0.00414)	(0.09093)	(0.00110)	(0.06804)	(0.00131)
	[689.447]	[3.20240]	[0.24392]	[-0.21203]	[-3.65011]	[1.83559]	[3.97907]	[4.28495]	[-0.40157]	[3.78931]
HONGKONG_$(-1)	0.006472	0.463473	-141.2071	-0.610776	-7.203761	-0.042616	-0.121081	-0.013983	-0.726452	-0.013548
	(0.00556)	(0.01716)	(56.1131)	(0.57485)	(8.16215)	(0.01587)	(0.34824)	(0.00421)	(0.26059)	(0.00501)
	[1.16421]	[27.0153]	[-2.51647]	[-1.06250]	[-0.88258]	[-2.68518]	[-0.34769]	[-3.31755]	[-2.78777]	[-2.70665]
INDONESIA_	1.23E-07	-2.41E-06	0.990840	-9.64E-06	0.000423	3.45E-06	7.08E-06	2.22E-07	4.68E-05	3.65E-07
RUPIAH(-1)	(2.9E-07)	(9.1E-07)	(0.00297)	(3.0E-05)	(0.00043)	(8.4E-07)	(1.8E-05)	(2.2E-07)	(1.4E-05)	(2.7E-07)
	[0.41701]	[-2.64977]	[333.518]	[-0.31677]	[0.97789]	[4.10198]	[0.38402]	[0.99524]	[3.38881]	[1.37863]
JAPAN_YEN(-1)	-9.57E-06	0.000410	0.464251	0.993925	-0.208333	-1.49E-05	-0.000937	4.96E-06	-0.003209	-7.07E-06
	(2.5E-05)	(7.7E-05)	(0.25137)	(0.00258)	(0.03656)	(7.1E-05)	(0.00156)	(1.9E-05)	(0.00117)	(2.2E-05)
	[-0.38413]	[5.33942]	[1.84690]	[385.972]	[-5.69782]	[-0.20911]	[-0.60061]	[0.26262]	[-2.74940]	[-0.31549]
KOREAN_WON(-1)	-2.31E-06	1.91E-05	0.029718	-0.000305	0.972684	5.28E-06	0.000490	3.97E-06	-0.000595	3.03E-06
	(2.9E-06)	(8.9E-06)	(0.02901)	(0.00030)	(0.00422)	(8.2E-06)	(0.00018)	(2.2E-06)	(0.00013)	(2.6E-06)
	[-0.80260]	[2.15116]	[1.02427]	[-1.02648]	[230.474]	[0.64281]	[2.72166]	[1.82312]	[-4.41655]	[1.17211]
MALAYSIA_	-0.002191	-0.028296	17.68205	0.403230	0.346304	0.943585	0.485468	0.000968	0.071285	0.001335
RINGGIT(-1)	(0.00258)	(0.00796)	(26.0445)	(0.26681)	(3.78840)	(0.00737)	(0.16163)	(0.00196)	(0.12095)	(0.00232)
	[-0.84925]	[-3.55351]	[0.67892]	[1.51129]	[0.09141]	[128.093]	[3.00350]	[0.49465]	[0.58938]	[0.57457]
PHILIPPINE_PESO(-1)	-0.000340	0.000131	-1.223642	-0.011385	0.260038	0.000250	0.944852	-0.000172	0.032253	-0.000237
	(0.00010)	(0.00031)	(1.00582)	(0.01030)	(0.14631)	(0.00028)	(0.00624)	(7.6E-05)	(0.00467)	(9.0E-05)
	[-3.41125]	[0.42605]	[-1.21656]	[-1.10492]	[1.77736]	[0.87798]	[151.366]	[-2.27364]	[6.90505]	[-2.63793]
SINGAPORE_$(-1)	0.014371	-0.020780	-285.8513	3.357009	60.00258	0.042803	-0.977800	0.919394	0.888714	0.922216
	(0.04102)	(0.12658)	(413.998)	(4.24119)	(60.2197)	(0.11709)	(2.56930)	(0.03110)	(1.92258)	(0.03693)
	[0.35040]	[-0.16417]	[-0.69047]	[0.79153]	[0.99639]	[0.36555]	[-0.38057]	[29.5656]	[0.46225]	[24.9712]
THAI_BAHT(-1)	0.000113	-0.001536	3.593312	-0.022916	-0.546842	0.000379	0.053504	0.000152	0.897980	0.000187
	(0.00018)	(0.00055)	(1.80306)	(0.01847)	(0.26227)	(0.00051)	(0.01119)	(0.00014)	(0.00837)	(0.00016)
	[0.63128]	[-2.78608]	[1.99289]	[-1.24061]	[-2.08503]	[0.74336]	[4.78146]	[1.12568]	[107.244]	[1.16398]

contd. table 2

BRUNEI_$(-1)	-0.007333	0.026872	171.2279	-2.683590	-10.46547	0.005664	-0.890015	0.060337	0.609429	0.057098
	(0.04028)	(0.12431)	(406.604)	(4.16544)	(59.1442)	(0.11500)	(2.52341)	(0.03054)	(1.88824)	(0.03627)
	[-0.18203]	[0.21616]	[0.42112]	[-0.64425]	[-0.17695]	[0.04925]	[-0.35270]	[1.97557]	[0.32275]	[1.57417]
C	-0.043478	4.164250	1119.000	4.991002	91.92772	0.337561	-0.331467	0.097118	5.953429	0.094070
	(0.04348)	(0.13417)	(438.844)	(4.49572)	(63.8337)	(0.12412)	(2.72349)	(0.03296)	(2.03796)	(0.03915)
	[-1.00004]	[31.0367]	[2.54988]	[1.11017]	[1.44011]	[2.71960]	[-0.12171]	[2.94627]	[2.92127]	[2.40296]
R-squared	0.999931	0.435471	0.995898	0.997603	0.993147	0.995462	0.993440	0.999125	0.993180	0.998765
Adj. R-squared	0.999931	0.433361	0.995883	0.997594	0.993122	0.995445	0.993416	0.999122	0.993155	0.998760
Sum sq. resids	0.108528	1.033606	11057400	1160.462	233955.3	0.884562	425.8779	0.062386	238.4641	0.087992
S.E. equation	0.006368	0.019653	64.28112	0.658525	9.350253	0.018181	0.398933	0.004828	0.298517	0.005734
F-statistic	3878700.	206.4232	64970.84	111388.3	38783.37	58705.25	40527.45	305572.8	38970.09	216385.5
Log likelihood	9779.405	6751.423	-14993.87	-2684.675	-9813.706	6960.629	-1337.923	10523.26	-558.7819	10061.22
Akaike AIC	-7.270863	-5.017062	11.16849	2.006457	7.312769	-5.172779	1.004037	-7.824534	0.424103	-7.480628
Schwarz SC	-7.246726	-4.992925	11.19263	2.030595	7.336907	-5.148641	1.028174	-7.800397	0.448240	-7.456490
Mean dependent	7.050638	7.772314	9688.751	99.95884	1088.465	3.393718	47.09232	1.427798	34.27141	1.427746
S.D. dependent	0.765302	0.026108	1001.803	13.42642	112.7421	0.269398	4.916434	0.162927	3.608005	0.162857
Determinant resid covariance (dof adj.)		1.180018								
Determinant resid covariance		1.140018								
Log likelihood		17386.21								
Akaike information criterion		-12.85911								
Schwarz criterion		-12.61773								

*Sources proceed by author

4.3. Testing Cointegration

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 3
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 No. of CE(s)	*Eigenvalue*	*Trace Statistic*	*0.05 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 penlitian accept that there are six variables are mutually cointegrated exchange rate, while siasnya not.

4.4. Equilibrium Relationship Testing and Error Correction Mechanism

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 4
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

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 ation 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.

4.5. Testing Causality

Tests using causality tests for variable currency exchange rate Asian region will be examined in detail to see the causal relationship between these variables. For until now has been a lot of evidence by using correlation test on the exchange rate meant. However, the correlation is identified does not mean causation. Therefore, causality test was used to see cause and effect earlier. Here we see the results of causality test for the currency exchange rate variable region east and southeast asia:

Table 5
Result Causality test

Pairwise Granger Causality Tests
Lags: 2

Null Hypothesis:	*Obs*	*F-Statistic*	*Prob.*
HONGKONG_$ does not Granger Cause CHINA_YUAN	2686	5.44328	0.0044
CHINA_YUAN does not Granger Cause HONGKONG_$		20.4116	2.0009
INDONESIA_RUPIAH does not Granger Cause CHINA_YUAN	2686	3.97187	0.0189
CHINA_YUAN does not Granger Cause INDONESIA_RUPIAH		0.72941	0.4823
JAPAN_YEN does not Granger Cause CHINA_YUAN	2686	1.01642	0.3620
CHINA_YUAN does not Granger Cause JAPAN_YEN		3.27021	0.0381
KOREAN_WON does not Granger Cause CHINA_YUAN	2686	10.0170	5.0005
CHINA_YUAN does not Granger Cause KOREAN_WON		2.20172	0.1108
MALAYSIA_RINGGIT does not Granger Cause CHINA_YUAN	2686	10.9748	2.0005
CHINA_YUAN does not Granger Cause MALAYSIA_RINGGIT		11.4043	1.E-05
PHILIPPINE_PESO does not Granger Cause CHINA_YUAN	2686	23.0550	1.0010
CHINA_YUAN does not Granger Cause PHILIPPINE_PESO		11.0288	2.0005
SINGAPORE_$ does not Granger Cause CHINA_YUAN	2686	6.90400	0.0010
CHINA_YUAN does not Granger Cause SINGAPORE_$		9.73089	6.0005
THAI_BAHT does not Granger Cause CHINA_YUAN	2686	10.2828	4.0005
CHINA_YUAN does not Granger Cause THAI_BAHT		10.3902	3.0005
BRUNEI_$ does not Granger Cause CHINA_YUAN	2686	6.75780	0.0012
CHINA_YUAN does not Granger Cause BRUNEI_$		11.9535	7.0006
INDONESIA_RUPIAH does not Granger Cause HONGKONG_$	2686	29.8611	1.0013
HONGKONG_$ does not Granger Cause INDONESIA_RUPIAH		3.01654	0.0491
JAPAN_YEN does not Granger Cause HONGKONG_$	2686	11.8034	8.0006
HONGKONG_$ does not Granger Cause JAPAN_YEN		1.32072	0.2671
KOREAN_WON does not Granger Cause HONGKONG_$	2686	11.3130	1.0005
HONGKONG_$ does not Granger Cause KOREAN_WON		2.87936	0.0563
MALAYSIA_RINGGIT does not Granger Cause HONGKONG_$	2686	2.77698	0.0624
HONGKONG_$ does not Granger Cause MALAYSIA_RINGGIT		0.38760	0.6787
PHILIPPINE_PESO does not Granger Cause HONGKONG_$	2686	3.81091	0.0222
HONGKONG_$ does not Granger Cause PHILIPPINE_PESO		0.24261	0.7846
SINGAPORE_$ does not Granger Cause HONGKONG_$	2686	11.4877	1.0005
HONGKONG_$ does not Granger Cause SINGAPORE_$		1.82771	0.1610
THAI_BAHT does not Granger Cause HONGKONG_$	2686	3.98873	0.0186
HONGKONG_$ does not Granger Cause THAI_BAHT		0.64065	0.5270

contd. table 5

Null Hypothesis:	*Obs*	*F-Statistic*	*Prob.*
BRUNEI_$ does not Granger Cause HONGKONG_$	2686	11.1875	1.0005
HONGKONG_$ does not Granger Cause BRUNEI_$		1.34920	0.2596
JAPAN_YEN does not Granger Cause INDONESIA_RUPIAH	2686	2.80566	0.0606
INDONESIA_RUPIAH does not Granger Cause JAPAN_YEN		3.22761	0.0398
KOREAN_WON does not Granger Cause INDONESIA_RUPIAH	2686	0.59007	0.5544
INDONESIA_RUPIAH does not Granger Cause KOREAN_WON		19.3678	4.0009
MALAYSIA_RINGGIT does not Granger Cause INDONESIA_RUPIAH	2686	0.00788	0.9922
INDONESIA_RUPIAH does not Granger Cause MALAYSIA_RINGGIT		11.5402	1.0005
PHILIPPINE_PESO does not Granger Cause INDONESIA_RUPIAH	2686	0.46974	0.6252
INDONESIA_RUPIAH does not Granger Cause PHILIPPINE_PESO		1.26545	0.2823
SINGAPORE_$ does not Granger Cause INDONESIA_RUPIAH	2686	0.41439	0.6608
INDONESIA_RUPIAH does not Granger Cause SINGAPORE_$		2.27422	0.1031
INDONESIA_RUPIAHTHAI_BAHT does not Granger Cause	2686	0.28739	0.7502
INDONESIA_RUPIAH does not Granger Cause THAI_BAHT		6.75333	0.0012
BRUNEI_$ does not Granger Cause INDONESIA_RUPIAH	2686	0.11402	0.8922
INDONESIA_RUPIAH does not Granger Cause BRUNEI_$		5.92840	0.0027
KOREAN_WON does not Granger Cause JAPAN_YEN	2686	0.97769	0.3763
JAPAN_YEN does not Granger Cause KOREAN_WON		6.44892	0.0016
MALAYSIA_RINGGIT does not Granger Cause JAPAN_YEN	2686	2.67444	0.0691
JAPAN_YEN does not Granger Cause MALAYSIA_RINGGIT		0.10386	0.9014
PHILIPPINE_PESO does not Granger Cause JAPAN_YEN	2686	2.03682	0.1306
JAPAN_YEN does not Granger Cause PHILIPPINE_PESO		0.95792	0.3838
SINGAPORE_$ does not Granger Cause JAPAN_YEN	2686	8.60645	0.0002
JAPAN_YEN does not Granger Cause SINGAPORE_$		0.15214	0.8589
THAI_BAHT does not Granger Cause JAPAN_YEN	2686	5.50743	0.0041
JAPAN_YEN does not Granger Cause THAI_BAHT		0.66935	0.5121
BRUNEI_$ does not Granger Cause JAPAN_YEN	2686	5.76075	0.0032
JAPAN_YEN does not Granger Cause BRUNEI_$		1.01200	0.3636
MALAYSIA_RINGGIT does not Granger Cause KOREAN_WON	2686	1.31769	0.2679
KOREAN_WON does not Granger Cause MALAYSIA_RINGGIT		8.66834	0.0002
PHILIPPINE_PESO does not Granger Cause KOREAN_WON	2686	0.45785	0.6327
KOREAN_WON does not Granger Cause PHILIPPINE_PESO		1.44784	0.2353
SINGAPORE_$ does not Granger Cause KOREAN_WON	2686	0.10013	0.9047
KOREAN_WON does not Granger Cause SINGAPORE_$		2.38285	0.0925
THAI_BAHT does not Granger Cause KOREAN_WON	2686	0.17894	0.8362
KOREAN_WON does not Granger Cause THAI_BAHT		2.09745	0.1230
BRUNEI_$ does not Granger Cause KOREAN_WON	2686	0.04495	0.9560
KOREAN_WON does not Granger Cause BRUNEI_$		4.89968	0.0075
PHILIPPINE_PESO does not Granger Cause MALAYSIA_RINGGIT	2686	6.41329	0.0017
MALAYSIA_RINGGIT does not Granger Cause PHILIPPINE_PESO		11.6084	1.0005
SINGAPORE_$ does not Granger Cause MALAYSIA_RINGGIT	2686	33.4008	5.0015
MALAYSIA_RINGGIT does not Granger Cause SINGAPORE_$		6.99887	0.0009
THAI_BAHT does not Granger Cause MALAYSIA_RINGGIT	2686	9.00135	0.0001
MALAYSIA_RINGGIT does not Granger Cause THAI_BAHT		14.0641	8.0007

contd. table 5

Null Hypothesis:	*Obs*	*F-Statistic*	*Prob.*
BRUNEI_$ does not Granger Cause MALAYSIA_RINGGIT	2686	22.3444	2.0010
MALAYSIA_RINGGIT does not Granger Cause BRUNEI_$		18.2953	1.0008
SINGAPORE_$ does not Granger Cause PHILIPPINE_PESO	2686	11.4112	1.0005
PHILIPPINE_PESO does not Granger Cause SINGAPORE_$		2.61564	0.0733
THAI_BAHT does not Granger Cause PHILIPPINE_PESO	2686	19.5480	4.0009
PHILIPPINE_PESO does not Granger Cause THAI_BAHT		21.4332	6.0010
BRUNEI_$ does not Granger Cause PHILIPPINE_PESO	2686	10.7677	2.0005
PHILIPPINE_PESO does not Granger Cause BRUNEI_$		6.40638	0.0017
THAI_BAHT does not Granger Cause SINGAPORE_$	2686	0.12263	0.8846
SINGAPORE_$ does not Granger Cause THAI_BAHT		23.6560	7.0011
BRUNEI_$ does not Granger Cause SINGAPORE_$	2686	2.44160	0.0872
SINGAPORE_$ does not Granger Cause BRUNEI_$		254.656	6.0102
BRUNEI_$ does not Granger Cause THAI_BAHT	2686	20.2739	2.0009
THAI_BAHT does not Granger Cause BRUNEI_$		0.86016	0.4232

*Sources proceed by author

In a first equation causal relationship is assumed that the variable Y is a function of its own lagged values and the lagged values of variable X. Accordingly, for the second equation is assumed that the variable X is a function of its own lagged values and the lagged values of the variable Y . So if we see from the output above shows the one-way causality using eg alpha probability of 5%. Results of research conducted not in accordance with the hypothesis made, saying that there is a relationship of mutual causality between variables currency exchange rates asia region.

5. CONCLUSION

From the research that has been done can be concluded that the exchange rate of the currency area of the east and southeast Asia, has data that is stationary by using lags 27. With VAR test can be concluded that the variables that influence the currency exchange rate region east asia and asia significantly is : Hongkong dollar t-1, and china yuan in t-1, while others do not unduly influence. In the long term, only six variables that influence each other, while the rest do not. However using ECM test concluded the exchange rate adjusted asia region in the next period to get the long-term equilibrium so that means, but mostly between the exchange rate has a one-way relationship is not bidirectional.

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