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E-Queue Mobile Application Johansen Cointegration-Granger Causality Model Relationship between IDR and BATH Currency

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Abstract

The purpose of this study to investigate the relationship in the long term and mutual relationship between the exchange rate of currency IDR (Indonesia) with BATH (Thailand). Study method used in this study, namely the Johansen cointegration and Granger causality. The data used in this study is the currency exchange rate IDR and BATH against the USD on a daily basis from January, 1 2004 to December, 31 2014. The empirical results show that the exchange rate of currency IDR and data BATH are not stationary at the level of intercept level, but the 1 st and 2 scd diff of data exchange stationary. Empirically also indicate that the data exchange rate of currency IDR and BATH cointegrated in the long term, but do not have a reciprocal relationship with using granger test at the rate lags 1-10, 15-20 lags the data using the exchange rate has a one-way relationship.

Keywords: Exchange Rate; Stationarity; Cointegration; Causality.

1. Introduction

After passing through the economic crisis of 2008, several countries in Asia such as China made a policy of currency depreciation or devaluation of the yuan against the US Dollar. The policy makes volatile financial markets and the impact on the exchange rate of currencies of developing countries like Indonesia. In a separate area of China is already doing twice the weakening exchange rate of the yuan of 1.9 percent on August 11, 2015 and 1.6 percent on Aug. 12, 2015. The weakening of the rupiah made slightly depreciated according to BI. Other causes are worries the Greek crisis resolution and policy The US central bank to raise interest rates bank. By doing so, the rupiah has depreciated reached 10.16 percent today. "The weakening of the currency higher than the Korean Won 8,35 per cent, amounting to 6.62 percent of Thailand Baht and Japanese Yen by 3.96 percent," he said after a meeting FKSSK at the Ministry of Finance, Jakarta, Thursday (13/8).

On the other hand the depreciation of the rupiah is still lower than the currency Malaysian Ringgit and Turkish Lira. Malaysian Ringgit currency has depreciated 13.16 percent and the Turkish lira reached 16 percent. "While Brazil's currency depreciated reached 29.4 percent. Meanwhile, the Australian Dollar depreciated currency reached 10.6 percent,". In this case the government of Indonesia through BI governor will continue to maintain macroeconomic stability and to coordinate with the Ministry of Finance to keep inflation correspond in the state budget. In addition, BI will stabilize the foreign exchange market in response to face the pressure that occurs at this time. "BI into industrial policy to achieve the inflation target in a prudent, maintain the liquidity of the economy in central and local levels as well as stabilizing the foreign exchange market and prudence in foreign debt,".

If the quote is described by Frenkel (1976), Branson (1983), Macdonald and Taylor (1992) and In Gavin, (1989), according to the monetary model of the exchange rate and the portfolio is seen as a relative asset prices. The present value of the assets which are considered largely influenced by the rate of return expected. Thus the real exchange rate has been determined by the exchange rate expected future. Model balance of the exchange rate can lead to a portfolio of domestic and stock prices rise, so will be able to persuade investors to buy domestic assets is

by selling foreign assets to obtain domestic currency back. The occurrence will increase in the demand for domestic currency will lead to the appreciation of the domestic currency. But separately, in case of a price increase with an increase in domestic assets, will be able to generate wealth growth indirectly, which in turn will increase the amount of money requested by the investor. It can provide better results with will lead to a rise in interest rates of domestic banks. Capital flows from abroad will be attracted into the country, in a situation such as this will increase the number of foreign demand for domestic currency as well as the basis for the exchange niali appreciation of domestic currency. Actually theoretically harmonious interaction does not occur, according to this theory, between stock prices and the exchange rate or the exchange rate with the exchange rate itself.

In Aggarwal (1981), Giovannini and Jorion (1987), and Roll (1992) there was an empirical study results in the form of a debate about the interaction of the exchange rate. If in the view over backward, a number of empirical studies have been done to investigate the relationship of exchange rates and other economic variables such as stock prices or interest rates. But the researchers have many find the same results or ambivalence about their relationship and the direction of the relationship that has made a gray area in the finance literature. Most of the research is to argue significant positive on the exchange rate and its effect, but some there who give a negative argument. As Soenen and Hennigar (1988), Franck and Young (1972), Solnik (1987), Chow et al. (1997), and Bhattacharya and Mukherjee (2003). Bahmani-Oskooee and Sohrabian (1992), Nieh and Lee (2001), which supports the negative argument. They found no occurrence and find long-term relationship between variables as the exchange rate effect on other economic variables, such as sample stocks and interest rates. So it can be deduced that there is no empirical harmony among researchers regarding the interaction of exchange value. However, with this further adds to contribute to the literature.

2. Literature Review

In Solnik (1987) and Jorion (1990) describes the impact of the detection of several economic variables, including the exchange rate. They conclude the occurrence of changes in exchange rates did not have a significant impact on other economic variables such as the case study of stock prices. They used a sample of several US companies that are multinational, and see the effectiveness of the exchange rate of the US dollar which is considered moderate discover relationships between variables. Using multiple regression models and correlation to determine the relationship between variables and show the results of various kinds.

For another study done by Bahmani-Oskooee and Sohrabian (1992), Nieh and Lee (2001), Roll (1992), Bahmani-Oskooee and Sohrabian (1992) and Chow et al. (1997) used a cointegration test and Granger causality test to detect the relationship between the variables in the exchange rate. They found bidirectional causality in the short term. They did not find a long-term relationship between the variables. support the findings and reported no significant long-term relationship between stock prices and exchange rates in the G-7 countries. In another study by adding a variable return stock, one of the researchers found a relationship between stock returns and the return value of the real exchange rate. They assume that this is a longer time horizon and found a positive association between variables was examined.

View Ajayi and Mougoue (1996), Yu (1997), Abdalla and Murinde (1997), and Ajayi et al. (1998) in his study provide an argument about how the appointment negative short-term and long-term impacts that are positive on the stock price variable to the value of the domestic currency. By mesih use analysis tools similar to the conclusion that Granger causality changes in stock prices. By using a co-integration test of the relationship between stock prices and exchange rates for the four Asian countries namely India, Pakistan, South Korea and the Philippines for the period 1985 to 1994. In their study detected unidirectional causality of the exchange rate with variable share price in Indian Country , South Korea and Pakistan, as well as finding the causality runs in the opposite direction to the Philippines. Using case studies the market from some developed countries like the United States, Korea and developing countries such as Malaysia, in a study they did find causality in the direction of the stock price to the foreign exchange market in the United States and Korea, and no relationship between the variables in Malaysia case.

3. Data and Methodology

Data and Time Research

The data used in this study, is data daily exchange rate of the exchange rate of two countries, namely Indonesia (IDR) and Thailand (BATH) from the year 2004 to 2014. The study was done during February 2017. The data can be authors by downloading and downloading from some sites such as WB, IMF, Blomberg, BI and others.

Data Analysis Techniques

In Gujarati, (2003) describes that the type of data used in this research is time series data. According Gujarati empirical time series data when in use must have a stationary element. While in Engle and Granger (1987) describes

the many studies that have shown that the data that the average time series that non-stationary or integrated of order 1. In this study used data test root test ADF statsioneritas to process the data, and use test Johansen cointegration to see the relationship between exchange rate variable in the long run. To see the interrelationships in the currency exchange rate in this study used the Granger test on the proposal by EWJ Granger.

4. Empirical Results

In this study used the ADF test as advised to look at the data by a stationary Eangle and Granger (1987). And also to the use of the long lag and bandwidth in the unit root tests were allowed to vary throughout the exchange rate, to improve serial correlation in the residuals. The test results analysis for root test presented in the table - one below.

Table 1: Root Test with Level Intercept Lag Length 1 for IDR and BATH				
Lag Length: 1 (Automatic - based on SIC, maxlag = 27) IDR has a unit root				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-2.563764	0.1008
Test critical values:	1% level		-3.432592	
	5% level		-2.862416	
	10% level		-2.567281	
Lag Length: 2 (Automatic - based on SIC, maxlag = 27) THAI_BAHT has a unit root				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-0.468679	0.8947
Test critical values:	1% level		-3.432593	
	5% level		-2.862417	
	10% level		-2.567282	
Level Intercept				
Sources : Proceed by author				

Table 2 : Root Test with Level Intercept Lag Length 1 for IDR and BATH				
Lag Length: 0 (Automatic - based on SIC, maxlag=27) D(IND_RUPIAH) has a unit root				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-55.62019	0.0001
Test critical values:	1% level		-3.432592	
	5% level		-2.862416	
	10% level		-2.567281	
MacKinnon (1996) one-sided p-values.				

Lag Length: 1 (Automatic - based on SIC, maxlag=27) D(THAI_BAHT) has a unit root				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-62.74602	0.0001
Test critical values:	1% level		-3.432593	
	5% level		-2.862417	
	10% level		-2.567282	
Level 1 st difference				
Sources : Proceed by author				

Table 3 : Root Test with Level Two Difference Intercept Lag Length 1 for IDR and BATH				
Lag Length: 14 (Automatic - based on SIC, maxlag=27) D(IND_RUPIAH,2) has a unit root				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-23.68646	0.0000
Test critical values:	1% level		-3.432606	
	5% level		-2.862422	
	10% level		-2.567285	
Lag Length: 27 (Automatic - based on SIC, maxlag=27) D(THAI_BAHT,2) has a unit root				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-18.08391	0.0000
Test critical values:	1% level		-3.432618	
	5% level		-2.862428	
	10% level		-2.567287	
Level 2 Second Difference				
Sources : Proceed by author				

If in view of data stationary test results to the exchange rate of the currency IDR and BATH, using lags intercept form level, the first difference and tow difference in Table 1-3 above. Already in make sure that the data exchange and BATH S is stationary. So to test cointegration and causality can proceed, as presented in Table 4 and 5 below.

Table 4: Cointegration Test With Lag 1-1 to 1-4 for IDR and BATH				
Lags interval (in first differences): 1 to 1				
Hypothesized		Trace	0.05	

No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None	0.002695	8.695737	15.49471	0.3943
At most 1	0.000538	1.445910	3.841466	0.2292
Lags interval (in first differences): 1 to 2				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None	0.002842	8.133930	15.49471	0.4512
At most 1	0.000184	0.492845	3.841466	0.4827
Lags interval (in first differences): 1 to 3				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None	0.002921	8.260652	15.49471	0.4379
At most 1	0.000152	0.408642	3.841466	0.5227
Lags interval (in first differences): 1 to 4				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None	0.002937	8.267337	15.49471	0.4373
At most 1	0.000140	0.375533	3.841466	0.5400
Sources : Proceed by author				

Table 5 : Granger Causality Test Lag 1,5,10,15 and 20 for IDR and BATH			
Lags: 1			
Null Hypothesis:	Obs	F-Statistic	Prob.
IND_RUPIAH does not Granger Cause THAI_BAHT	2687	0.79785	0.3718
THAI_BAHT does not Granger Cause IND_RUPIAH		0.00708	0.9330
Lags: 5			
Null Hypothesis:	Obs	F-Statistic	Prob.
IND_RUPIAH does not Granger Cause THAI_BAHT	2683	6.85249	2.E-06
THAI_BAHT does not Granger Cause IND_RUPIAH		1.24116	0.2870

Lags: 10			
Null Hypothesis:	Obs	F-Statistic	Prob.
IND_RUPIAH does not Granger Cause THAI_BAHT	2678	4.06735	1.E-05
THAI_BAHT does not Granger Cause IND_RUPIAH		0.85966	0.5709
Lags: 15			
Null Hypothesis:	Obs	F-Statistic	Prob.
IND_RUPIAH does not Granger Cause THAI_BAHT	2673	2.88324	0.0002
THAI_BAHT does not Granger Cause IND_RUPIAH		0.76235	0.7209
Lags: 20			
Null Hypothesis:	Obs	F-Statistic	Prob.
IND_RUPIAH does not Granger Cause THAI_BAHT	2668	2.32337	0.0008
THAI_BAHT does not Granger Cause IND_RUPIAH		0.63667	0.8880
Sources : Proceed by author			

Using the model of Johansen test for cointegration and granger causalitas to reciprocity, we can see the results in Table 4 that the data exchange rate of currency IDR and BATH not cointegrated in the long term begin using lags interval 1-1 up to 1-4. As for the causality test in Table 5 at lags 15 and 20, a data exchange rate of currency IDR and BATH only have one-way relationship, at lags 1, 5 and 10 do not have a relationship one-way and two-way.

5. Conclusion

Of the studies that have been done by using test stationarity, cointegration and causality for data exchange rate of currency IDR (Indonesia) and BATH (Thailand), it can be concluded that the exchange rate of currency IDR and BATH of data exchange that is stationary, but between the exchange rate does not have a relationship in the long term and does not have a reciprocal relationship, but by using lags 15 and 20, the data exchange rate experienced a one-way relationship.

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