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Article

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Contemporary Economics

Provided in Cooperation with:

University of Finance and Management, Warsaw

Suggested Citation: de Castro-Pardo, Mónica; Fernández Martínez, Pascual; Guaita Martínez, José Manuel; Martín Martín, José María (2019) : Is ringgit really influenced by crude oil price? Evidence from commodity and bank lending markets, Contemporary Economics, ISSN 2300-8814, University of Finance and Management in Warsaw, Faculty of Management and Finance, Warsaw, Vol. 13, Iss. 4, pp. 407-416,
<https://doi.org/10.5709/ce.1897-9254.322>

This Version is available at:

<https://hdl.handle.net/10419/297493>

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Primary submission: 18.12.2018 | Final acceptance: 25.06.2019

Is Ringgit Really Influenced by Crude Oil Price? Evidence From Commodity and Bank Lending Markets

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ABSTRACT

This study aims to investigate the effects of crude oil price (COP) and base rate (BR) on the strength of the Ringgit (RM) against the US Dollar (USD). Within the framework of the international Fisher effect theory, the study employs yearly data from the Bloomberg Database over an observed period from 1984 through 2017. Using bivariate Engle-Granger cointegration test as an estimation tool, the study reveals the presence of a long-term relationship between the RM and COP. However, the results of the Granger Causality test show an absence of a dynamic relationship between them. From the second analysis between the RM and BR, the study finds the presence of both long-term and short-term relationships between them. Interestingly, the relationship is somewhat bidirectional. Overall, the study has suggested the relevance of the international Fisher effect in explaining how variations in the RM exchange rate are elucidated by the bank lending market. In addition, it is worth noting that both BR and COP exert a significant influence on the strength of the RM against USD over time.

KEY WORDS:

Bivariate cointegration test, crude oil price, Malaysia base rate, Malaysia exchange rate, Granger causality test, error-correction term, international Fisher theory

JEL Classification: G15, F10, O11

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1. Introduction

Complaints are often heard from the general public about the weakening of the Ringgit (RM) against other major currencies over the past five years. Undoubtedly, the weakening of RM is not something that Malaysian importers and even investors relish. Some analysts even associate the relative strength of the Ringgit with the movement of crude oil prices. Based on this general perception, we would like to investi-

gate to what extent this notion is valid. As such, this study is driven a motivation to examine the relevance of crude oil prices in influencing the relative strength of RM against a major currency such as the USD. In addition to focusing on movements of crude oil price, this study takes the bank lending rate as a proxy for comparison. Technically, we will observe how these two different markets the commodity and lending markets may influence the relative strength of the RM against the USD in the foreign exchange market. Stability in foreign exchange rates is important for every country, particularly for those developing countries that rely heavily on imports of capital goods. In this respect, the weakening of the RM will trigger an increase

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in the foreign exchange rate risk, as a hike in import prices will pose a potential inflationary pressure on the economy. This situation is what economists refer to as cost-push inflation. Subsequently, an increase in this expectation of inflation will place an upward pressure on the interest rate level in the economy.

The consistent surge in crude oil prices from 1984 through 2017 occurred in tandem with the strengthening of the RM in relation to other currencies. The significant contribution of Malaysia's crude oil industry to economic growth has led researchers to examine the possible transmission mechanisms between the RM and COP. Thus, the central objective of this study is to investigate the cause and effect relationship between the RM and COP, as well as the effect of the base rate (BR) on the RM. It has been argued that the soaring of COP has strengthened the RM in tandem with the adjustment of the base lending rate in the financial market. In the past, an increase in crude oil price has led to an increase in the USD exchange rate due to the change in the current account deficit, which depreciates the local currency (Beckmann & Czudaj, 2013; Nazlioglu & Soytas, 2011).

2. Literature Review

Previous studies have recognized the significant relationship between COP and major currencies such as the USD and the Euro (Bénassy-Quéré, Mignon, & Penot, 2007). Johansen and Juselius (1990) also acknowledge that there is a strong relationship between COP and the currency rate, such as the USD and Euro rate. The relationship between COP and currency also depends on the distribution of oil imports across oil-importing countries and non-oil-importing countries (Bénassy-Quéré et al., 2007).

Several theories explain the market mechanisms of COP: the terms of trade channel (Buetzer, Habib, & Stracca, 2012), the wealth effect channel (Krugman, 1983), the portfolio reallocation channel (Bénassy-Quéré et al., 2007) and the international Fisher effect (Krugman, 2008). The terms of trade theory postulates that if the non-tradable sector of country A is more energy intensive, the output price of this sector will increase relative to the output price of country B. Thus, effects on the nominal exchange rate arise if the price of tradable goods is no longer assumed to be fixed. In this case, inflation and nominal exchange rate dynam-

ics are related via purchasing power parity. If the COP increases, then the currencies of countries with large oil dependence in the tradable sector will depreciate due to higher inflation. The wealth channel theory reflects the resulting short-term effect, while the portfolio reallocation channel theory assesses the medium and long-term impacts on the crude oil price on the real exchange rate (Bénassy-Quéré et al., 2007).

When oil prices increase, wealth is transferred to oil exporting countries (in USD terms) and is reflected as an improvement in export value and the current account balance in domestic currency terms. Thus, the currencies of oil-exporting countries appreciate while those of oil-importers depreciate in effective terms following an increase following an increase in oil prices (Beckmann & Czudaj, 2013). There is a tendency for the wealth effect on the USD to appreciate in the short-term because oil-exporting countries may reinvest their oil revenues in US dollar assets. The portfolio effect on the currency-relative value is attributed to two important factors: oil exporters' relative preferences for US dollar assets and the dependence of the United States on oil imports relative to the share of US exports to oil-producing countries (Bénassy-Quéré et al., 2007; Buetzer et al., 2012). As the world oil price is denominated in the USD it is imperative to point out the direction of causality from the USD exchange rate to COP (Beckmann, Czudaj, & Arora, 2017).

The international Fisher effect (IFE) explains the scenario in the international financial markets which links the purchasing power parity (PPP) with the impact of relative changes in nominal interest rates among trading countries on the foreign exchange rates. Based on the PPP theory, the exchange rates will move to offset changes in inflation rate variances. Thus, an increase in a country's inflation rate relative to other countries will result in the currency's depreciation (Buckley, 2004; Eun & Resnick, 2011; Madura, 2014). Alizadeh, Nassir, and Abou Masoudi (2014) present a rather surprising finding in their study of 10 ASEAN member countries. Their results reveal that exchange rates movements do not follow the IFE theory and that nominal interest rate differentials cannot entirely offset changes in currency values in those countries in the long term, with the exception of Ringgit-Rupiah exchange rates.

If real interest rates are the same across the country, any difference in nominal interest rates could be

Table 1. Determinants of the RM exchange rates (RM/USD)

Explanatory variable	Expected impact
Average COP	Negative
Base rate (BR)	Positive

attributed to differences in inflation expectation. Foreign currencies with relatively high-interest rates will depreciate because the high nominal interest rates reflect an expectation of higher inflation in the future (Shalishali, 2012). The IFE explains that the interest rate differential between any two countries is an unbiased predictor of future changes in the spot rate of exchange.

The primary purpose of this paper is to investigate the relationship between the RM exchange rate and COP, as well as the effect of changes in BR on the RM stability rate over the short and long terms. In Malaysia, determining a bank's lending rate will depend upon the bank's liquidity, profitability and the statutory requirements set forth by the central bank of Malaysia. This reserve requirement dictates that financial institutions hold a certain level of liquid assets, making them less likely to be able to provide short-term lending (Francis, 2013). Subsequently, the following research questions are studied:

- 1) Does COP influence the RM exchange rate?
- 2) What is the lead-lag relation between BR and RM exchange rate?

3. Methodology

The study involves yearly datasets from 1984 through 2017 sourced from the Bank Negara Malaysia Statistical Bulletin and the Bloomberg Database. The study re-examines the theoretical relationship between the foreign exchange market and commodity market, as well as the commercial bank's lending rate. In this regard, the bank's lending rate is proxied by the base rate (BR), a new lending rate introduced by Bank Negara Malaysia (Central Bank of Malaysia) in January 2015. Previously, this lending rate was known as the base lending rate (BLR). The introduction of BR allows Malaysian

commercial banks to determine their own lending rate based on their individual cost of funds, profit margin, risk premiums and the central bank's statutory reserve requirements (SRR).

3.1 Empirical Model

This study replicates the work of Nazlioglu and Soytaş (2011) on the effect of COP on the commodity market. Accordingly, the empirical model is specified as:

$$USDEX = \alpha + \alpha_1 COP_t + e_t \quad (1)$$

where USDEX is the real USD exchange rate and COP represents crude oil prices in the commodity market. The empirical model identifies the real USD exchange rate as determined by the volatility in the oil price market (Bénassy-Quéré et al., 2007; Buetzer et al., 2012).

3.2 Model Specification and Variables

Model specification and variable identification are operationalized in line with previous research (Hill, 2004; Nazlioglu & Soytaş, 2011) but with slight alterations. This study uses the Engle-Granger two-step cointegration test (1987) as an estimation tool and splits the two explanatory variables (BR and COP) into two different bivariate estimation models: the RM-BR and the RM-COP. Based on the econometrics time-series approach, a cointegrating regression analysis is used to estimate the RM exchange rates. The following two model specifications are proposed:

$$RM_t = f(COP_t) \quad (2)$$

$$RM_t = f(BR_t) \quad (3)$$

where RM_t is the real RM exchange rate in the foreign exchange market, while COP and BR represent the WTI crude oil prices in the commodity market and the base lending rates in the Malaysian financial

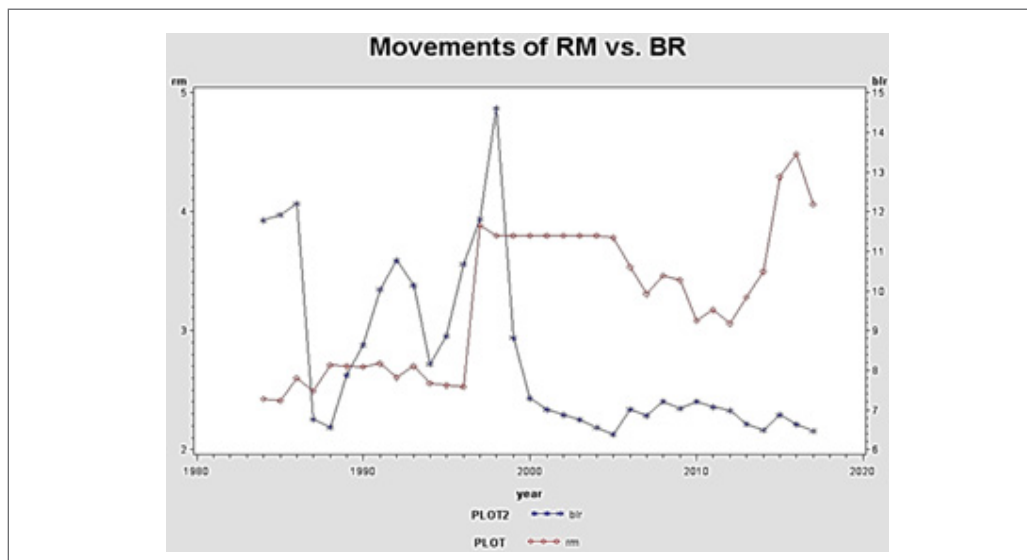


Figure 1. Movements of the RM exchange rates against the base lending rate (BR).

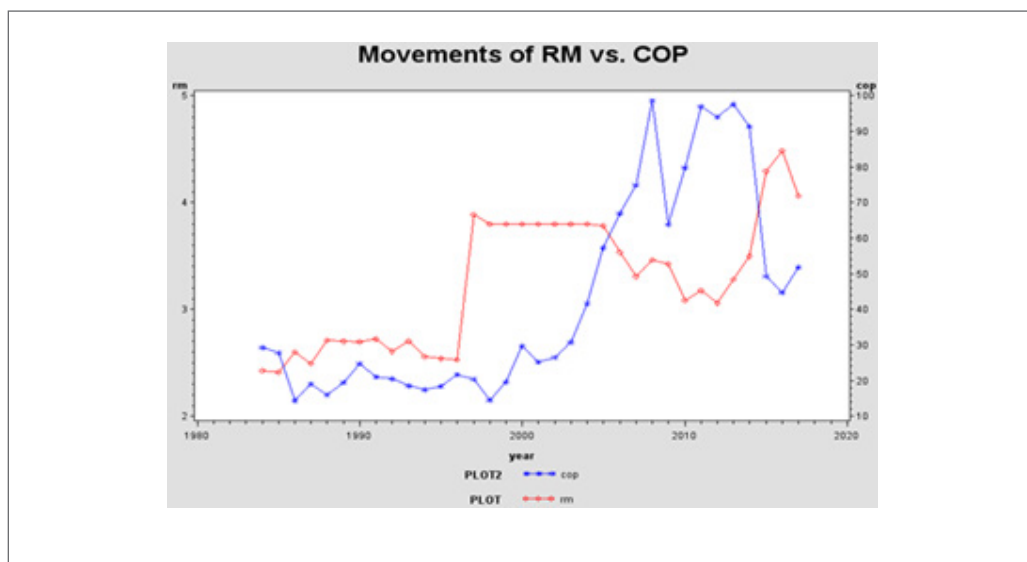


Figure 2. Movements of the RM exchange rates against crude oil price (COP)

Table 2. Descriptive statistics

Label	N	Mean	SD	Minimum	Maximum
West Texas Intermediate (USD)	34	42.4843529	28.6681371	14.413	98.58
Base Rate (%)	34	8.325	2.1738825	6.38	14.61
Ringgit/USD	34	3.2538118	0.6064199	2.4135	4.486

Table 3. Augumented Dickey-Fuller stationarity test on RM, BR, and COP at level

H_0 : Data series are non-stationary at level

Type	Lags	Tau	$P_{rRM} < \text{Tau}$	Tau	$P_{rBR} < \text{Tau}$	Tau	$P_{rCOP} < \text{Tau}$
Zero Mean	1	0.61	0.8436	-1.16	0.2171	-0.40	0.5297
	2	0.60	0.8396	-1.22	0.1973	-0.23	0.5969
	3	0.72	0.8654	-0.56	0.4641	-0.61	0.4437
	4	0.61	0.8429	-0.69	0.4074	-0.13	0.6295

Table 4. Augumented Dickey-Fuller stationarity test on RM, BR, and COP at first difference

H_0 : Data series are non-stationary at first difference

Type	Lags	Tau	$P_{rRM} < \text{Tau}$	Tau	$P_{rBR} < \text{Tau}$	Tau	$P_{rCOP} < \text{Tau}$
Zero Mean	1	-3.89	0.0003	-4.49	<.0001	-4.31	<.0001
	2	-3.32	0.0017	-5.09	<.0001	-2.32	0.0216
	3	-2.61	0.0109	-4.95	<.0001	-2.48	0.0150
	4	-2.43	0.0168	-3.43	0.0013	-2.08	0.0375

market respectively. Table 1 illustrates the expected relationship between the RM exchange rates and their explanatory variables COP and BR.

4. Empirical Results

Figures 1 and 2 below illustrate the trend lines of the RM against the BR and COP respectively. From these

biaxis graphs, RM and COP seem to move in unison, indicating some kind of relationship.

The descriptive statistics for the RM exchange rates, BR and CPO are presented in Table 2. The weakest level of the RM is at RM4.486 per USD, while the highest level of BR is at 14.61%. Meanwhile, COP registered its highest level at USD98.58 in 2008.

Table 5. Augmented Dickey-Fuller stationarity test on model residuals

(RM & BR model)					(RM & COP model)				
H_0 : Data series are non-stationary at first difference					H_0 : data series are non-stationary				
Type	Lags	Rho	P < Rho	Tau	P < Tau	Rho	P < Rho	Tau	P < Tau
Zero Mean	0	-7.4634	0.0515	-1.98	0.047	-6.021	0.0829	-1.79	0.0696
	1	-14.4068	0.0049	-2.52	0.014	-9.924	0.0226	-2.13	0.0335
	2	-10.9416	0.0159	-1.9	0.056	-11.89	0.0115	-1.98	0.0474
	3	-11.5558	0.0128	-2.08	0.038	-12.49	0.0093	-1.96	0.0495
	4	-10.4567	0.0182	-1.72	0.081	-17.4	0.0014	-1.85	0.0612

Table 6. RM-BR error correction model estimation (ECM 1)

RM exchange rate = dependent variable					Base rate = dependent variable				
Variable	DF	Parameter estimate	SD	t value	$P_r < t $	Parameter estimate	SD	t value	$P_r < t $
Intercept	1	0.04757	0.05862	0.81	0.424	-0.32312	0.28803	-1.12	0.2715
Ldbr	1	+0.02062	0.03461	0.6	0.556	-0.00157	0.17009	-0.01	0.9927
Lr	1	-0.17605	0.11372	-1.55	0.133*	-1.33782	0.55878	-2.39	0.0236*
Ldrm	1	0.09988	0.20902	0.48	0.637	+2.26713	1.02710	2.21	0.0357*

Table 7. RM-COP error correction model estimation (ECM 1)

RM exchange rate = dependent variable					
Variable	DF	Parameter estimate	SD	t value	$P_r < t $
Intercept	1	0.04465	0.05779	0.77	0.446
Ldcop	1	-0.000484	0.00473	-0.1	0.919
Lr	1	-0.19693	0.10765	-1.83	0.078*
Ldrm	1	0.11	0.21136	0.52	0.607

Table 8. Impulse-response functions (RM vs. BR)

Variable response/impulse	Lag	RM	BR
RM	1	0.96538	0.00462
	2	0.92660	-0.01683
	3	0.84976	-0.02990
	4	0.81657	-0.03311
	5	0.81620	-0.03088
	6	0.82765	-0.02814
	7	0.83626	-0.02686
	8	0.83876	-0.02684
	9	0.83768	-0.02727
	10	0.83601	-0.02759
BLR	1	1.28026	0.59915
	2	-0.66820	0.17658
	3	-2.03387	-0.04091
	4	-2.48000	-0.05109
	5	-2.32733	0.01457
	6	-2.06369	0.06726
	7	-1.91882	0.08401
	8	-1.90124	0.07845
	9	-1.93776	0.06857
	10	-1.97103	0.06310

Table 9. Impulse-response functions (RM vs. COP)

Variable response/impulse	Lag	RM	BR
RM	1	0.92334	0.00143
	2	0.74008	0.00363
	3	0.57868	0.00510
	4	0.47457	0.00601
	5	0.41292	0.00652
	6	0.37853	0.00681
	7	0.35991	0.00696
	8	0.35005	0.00704
	9	0.34489	0.00708
	10	0.34222	0.00710
COP	1	-14.16277	0.74760
	2	-1.45999	0.66385
	3	7.15567	0.57037
	4	13.40458	0.51803
	5	17.04592	0.48678
	6	19.11244	0.46981
	7	20.23166	0.46066
	8	20.82720	0.45585
	9	21.13894	0.45335
	10	21.30059	0.45205

Table 3 presents the results of the stationarity test showing that three variables are found to be non-stationary at level (see p-values). On the contrary, Table 4 shows that all the first-differenced RM, BR and COP are stationary, suggesting that they are all integrated at first difference. At this juncture, the basic requirement in the Engle-Granger Cointegration (1987) test has been fulfilled and a final stationarity test must be performed on the model long-term residuals.

The results of the augmented Dickey-Fuller stationarity test, as presented in Table 5, indicate that the model long-term residuals are stationary at all lags (at the 10% significance level). These results lead to one important implication having the long-term residuals stationary implies that the individual tested variables (BR and COP) and the RM are said to be cointegrated. For this reason, the error correction model can be mobilized further.

The bivariate error correction model (ECM) is employed to investigate the short-term and long-term causality in the two tested models. Based on

the regression results, the optimal lag-length for both models lies at lag 1 and detailed results are presented in Tables 6 and 7 below. Analyzing the first model involving RM and BR in Table 6, the study finds the presence of both long-term and short-term relationships (see the p-values) between them. Specifically, RM 'Granger-causes' BR, suggesting that the RM exchange rate is indeed a leading economic variable (Hussain, Salem, Rashid, & Kamarudin, 2019). It is important to note that the individual p-value on the test of significance on lr (error correction term at lag 1) is divided by two because ECM is based on the premise of one-tail residuals distribution. The coefficient of lr is -0.1760 , which represents the model speed of adjustment. This figure signifies a 17.60% speed of adjustment towards equilibrium made by the RM exchange rate in the system. Technically, a higher speed of adjustment is preferred because a credible endogenous variable in any model should reflect a high speed in its equilibrium adjustment. In-

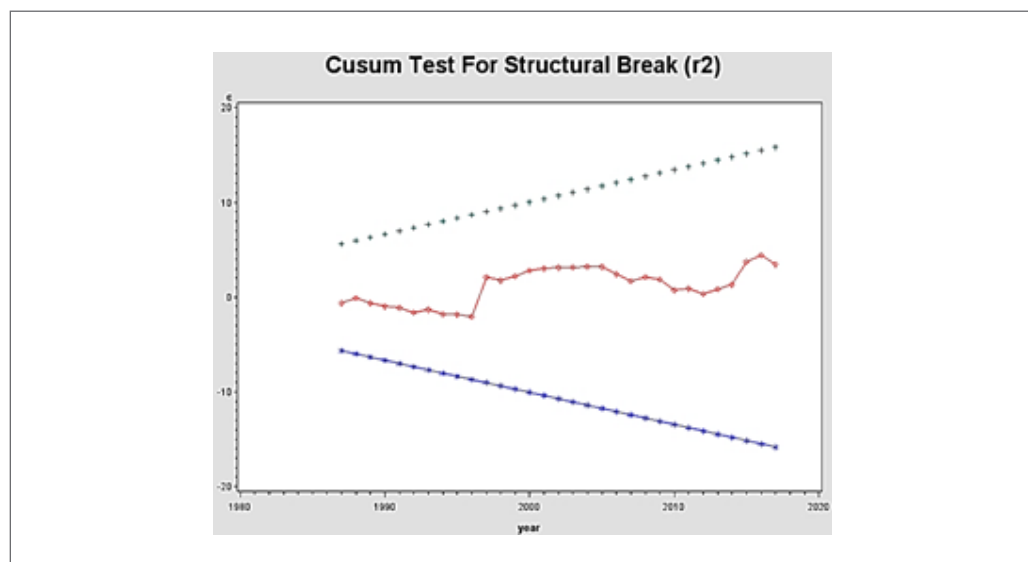


Figure 3. Cusum test on the RM-BR model

terestingly, there is a positive relationship (see coefficient of l_{dbr}) between these two variables, and this model is somewhat bidirectional.

Moving to the second model in Table 7, the study finds the presence of a long-term relationship between RM and COP, but the dynamic relation between them is absent. This finding is consistent with the work Chen, Rogoff, and Rossi (2010). The absence of short-term causality running from COP to RM could possibly be because the world oil price is quoted in USD (Akram, 2009). Looking at the speed of adjustment in the RM-COP model, the value is relatively higher at 19.69%. As explained earlier, the speed of adjustment towards equilibrium is somehow faster than in the first model. Unlike the first model, RM-COP is a uni-directional model, and there is a negative relationship between RM exchange rate and COP. Basher, Haug, and Sadorsky (2012) also report this negative correlation.

However, the analysis of dynamic interactions via impulse-response functions during the postsample period demonstrates some interesting findings. As presented in Tables 8 and 9, the results reveal that RM is the most exogenous variable of all. With one

standard deviation shock applied on RM, both BLR and COP responded rigorously. For this reason, the RM exchange rate against USD is unquestionably a leading economic indicator.

Cusum analysis (or cumulative sum of residual test) is another important tool in econometric modeling and is used to tackle diagnostic problems related to parameter instability. From the two charts below (Figures 3 and 4), the existence of parameter (short-term and long-term parameters) stability in the two models is therefore confirmed. It is clear that the short-term residuals from the two models lie within the lower and upper boundaries. As a whole, the predictive RM models developed from this study are considered credible since no major diagnostic shortcomings are detected.

6. Conclusion

This study has proven that RM and BR are cointegrated. A similar result is also observed for the relationship between the RM and COP. As such, it is worth noting that both BR and COP significantly influence RM exchange rate in the long term. However, the Granger Causality test only supports the presence of

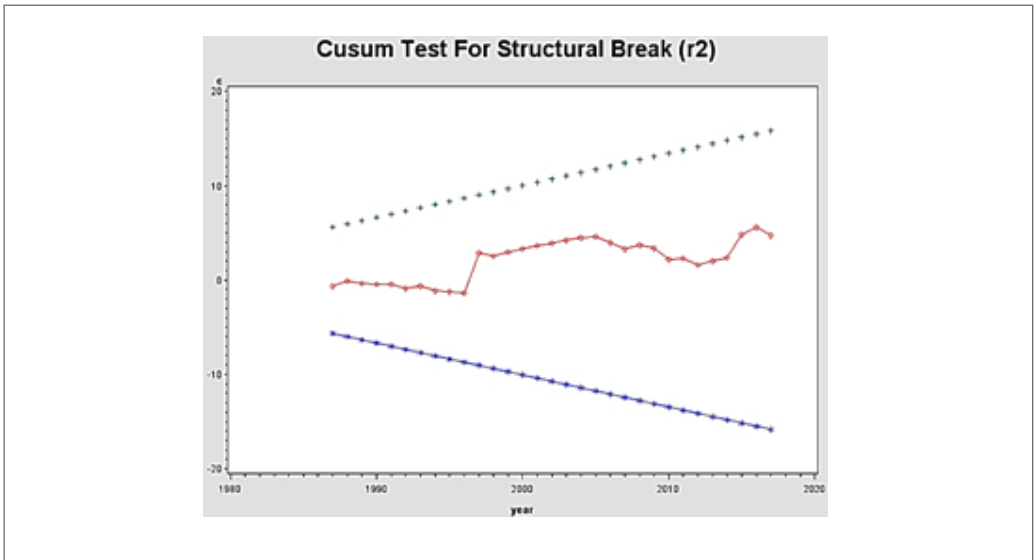


Figure 4. Cusum test on the RM-COP model

a dynamic relation between RM and BR. Interestingly, the relationship between RM and BR is somewhat bidirectional. It is now evident that there is a strong and significant connection between the financial markets and the commodity market. Any changes in the central bank's monetary policy not only affect the financial market in particular but also the commodity market at large. The foreign exchange market is part of the financial system and is therefore vulnerable to changes in market dynamics. As anticipated, the RM exchange rate is found to have a positive relationship with BR, while it is opposite for RM and COP. The weakening of RM can be attributed to the increase in interest rate level, as well as to the plummeting of crude oil price. The policy implication stemming from this study is that BR and COP are two leading economic indicators that significantly influence the relative strength of RM against USD.

Having established this theoretical link, international traders (importers and exporters) must formulate correct business strategies not only to protect their business transaction value but also to explore export opportunities in other countries. The BR is considered as a proxy for a long-term borrowing rate, which reflects the market and inflationary risks. We recom-

mend that future researchers consider incorporating the 2018 dataset and include short-term interest rate as a new variable in this empirical model. In summary, the empirical evidence from this study supports the essence of the international Fisher effect (IFE). This theory postulates that an estimated change in the current exchange rate between any two currencies is directly proportional to the difference between the two countries' nominal interest rates at a given time. A higher nominal interest rate directly implies a higher expectation of inflation, which in turn reduces investors' long-term confidence in the economy.

References

- Akram, Q. F. (2009). Commodity prices, interest rates and the dollar. *Energy Economics*, 31(6), 838-851.
- Alizadeh, H. N., Nassir, A. M., & Abou Masoudi, S. Y. S. (2014). An empirical investigation of international Fisher effect on 10 ASEAN Countries. *Journal of Applied Sciences*, 14(6), 531-536.
- Basher, S., Haug, A., & Sadorsky, P. (2012). Oil prices, exchange rates and emerging stock markets. *Energy Economics*, 34(1), 227-240.
- Beckmann, J., Czudaj, R., & Arora, V. (2017, June). *The relationship between oil prices and exchange*

- rates: *Theory and evidence (Working Paper Series)*. Washington, DC: Department of Energy. Retrieved from https://www.eia.gov/workingpapers/pdf/oil_exchangerates_61317.pdf
- Beckmann, J., & Czudaj, R. (2013). Oil prices and effective dollar exchange rates. *International Review of Economics & Finance*, 27, 621-636.
- Bénassy-Quéré, A., Mignon, V., & Penot, A. (2007). China and the relationship between the oil price and the dollar. *Energy Policy*, 35(11), 5795-5805.
- Buckley, A. (2004). *Multinational finance*. Harlow, UK: Pearson Education Limited.
- Buetzer, S., Habib, M. M., & Stracca, L. (2012). *Global exchange rate configurations: Do oil shocks matter? (Working Paper No. 1442)*. European Central Bank. Retrieved from <https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1442.pdf>
- Chen, Y. C., Rogoff, K. S., & Rossi, B. (2010). Can exchange rate forecast commodity prices? *The Quarterly Journal of Economics*, 125(3), 1145-1194.
- Engle, R. F., & Granger, C. W. J. (1987). Co-integration and error correction: Representation, estimation and testing. *Econometrica*, 55(2), 251 - 276.
- Eun, C. S., & Resnick, B. G. (2011). *International financial management* (6th ed.). New York, NY: McGraw-Hill/Irwin.
- Francis, M. E. (2013). Determinants of commercial bank profitability in Sub-Saharan Africa. *International Journal of Economics and Finance*, 5(9), 134-147.
- Hill, C. W. L. (2004). *International business competing in the global market place* (5th ed.). New York, NY: McGraw Hill Higher Education.
- Hussain, H. I., Salem, M. A., Rashid, A. Z. A., & Kamarudin, F. (2019). Environmental impact of sectoral energy consumption on economic growth in Malaysia: Evidence from ARDL bound testing approach. *Ekoloji*, 28(107), 199 - 210.
- Johansen, S., & Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration—with applications to the demand for money. *Oxford Bulletin of Economics and Statistics*, 52(2), 169-210.
- Krugman, P. (1983). New theories of trade among industrial countries. *The American Economic Review*, 73(2), 343-347.
- Krugman, P. R. (2008). *International economics: Theory and policy (8th ed.)*. Boston, MA: Prentice Hall.
- Madura, J. (2014). *International Financial Management* (12th ed.). Stamford, CT: Cengage Learning.
- Nazlioglu, S., & Soytas, U. (2011). World oil prices and agricultural commodity prices: Evidence from an emerging market. *Energy Economics*, 33(3), 488-496.
- Shalishali, M. K. (2012). A test of the international fisher effect in selected Asian countries. *International Journal of Humanities and Social Science*, 2(4), 86-92.