



# Impact of Foreign Exchange Administration Rule on the Nexus between Country-Specific FDI and Malaysian Currency

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## Abstract

In the aftermath of the US Presidential election on 8 November 2016, the Malaysian currency Ringgit (MYR) had witnessed unprecedented volatility in its value relative to the USD. As a policy response, Bank Negara Malaysia (BNM) implemented a Supplemental Foreign Exchange Administration (SFEA) Rule in December 2016. Exporters are required to convert 75 per cent of foreign currency proceeds from the exports of goods into MYR with a licensed onshore bank. This study evaluates the impact of the new SFEA Rule on the relationship between country-specific FDI and MYR. Based on the data of five major inward FDI countries from 2015 to 2018, our results show: Firstly, Japanese FDI strengthens MYR in post-SFEA Rule; Secondly, FDI from Singapore is found to exert downward pressure on MYR; Thirdly, FDI from China, the Netherlands and the US are insignificant in influencing the MYR; Finally, inward FDI from different countries responds differently to the Rule. Notably, the results obtained are robust to different measures of the exchange rate. On policy suggestion, the Foreign Exchange Rule should also target non-export oriented inward FDIs to achieve the policy target. The result also highlights the importance of export-oriented FDIs for the long-run benefit of the Malaysian economy.

**JEL classification:** E58, F31, G18

**Keywords:** foreign exchange rule, exchange control, Malaysia, Japanese investment, foreign direct investment

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## 1.0 Introduction

After the US Presidential election was announced on 8 November 2016, most Asian currencies witnessed unprecedented volatility to US dollars. Likewise, the Malaysian currency Ringgit (MYR USD) also suffered a similar fate to other Southeast Asian nations. This uncertainty was detrimental to international trade as importers pay higher exchange rates while countries face an unfavourable balance of payment in their trade with the rest of the world.

As an immediate response to slow down the decline of MYR USD, the Bank Negara Malaysia (BNM, the Central Bank of Malaysia) announced a new measure on 2 December 2016 to encourage the greater use of local currency in domestic trade to increase liquidity for the market.<sup>3</sup> Under the Supplementary Notice on Foreign Exchange Administration Rules - Measures to Promote the Development of Malaysian Financial Market issued on 2 December and to take effect on 5 December 2016. The new measure is expected to bring a positive impact on the value of MYR by BNM.

Under the Supplemental Foreign Exchange Administration (SFEA) rule, exporters must convert 75 per cent of export proceeds to local currency with one of the onshore financial institutions. They can only retain 25 per cent of the export proceeds in foreign currencies. The new ruling caught many exporters, including foreign multinationals (MNCs), by surprise. The Japanese exporters were not given enough time to respond to the new ruling, according to the reports produced by JETRO (2017).

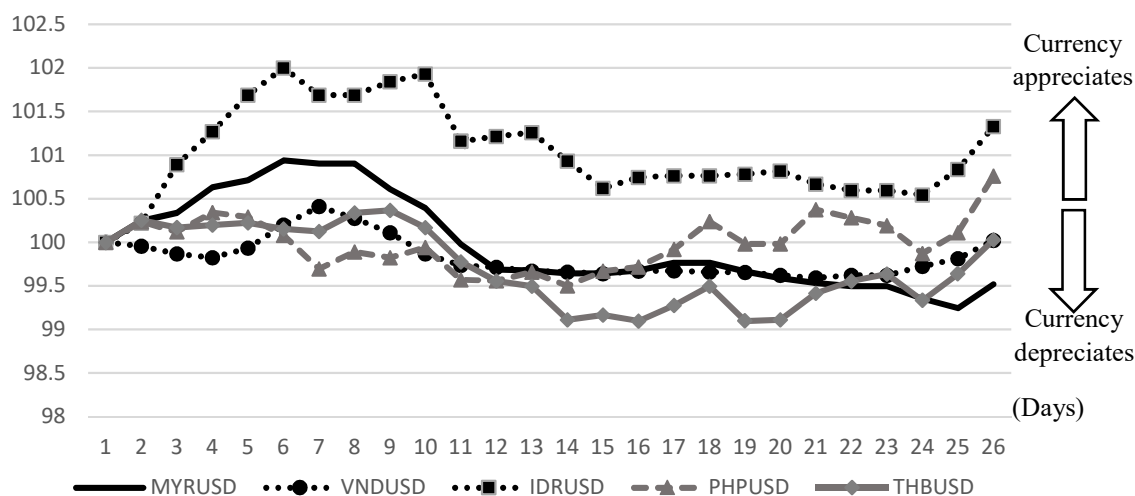
As MNCs need to make payment for their commitments in different currencies with fast funds transfer, the new ruling created additional documentation, work process, and increased compliance costs. Hence, it is a balancing act for the authority to ensure MNCs' efficiency is maintained despite the new ruling. However, on the other hand, it is also essential to maintain the competitive edge of the exporters who have built their manufacturing base in Malaysia relative to other ASEAN countries.

As shown in Figure 1, it can be observed that most ASEAN currencies show volatile movement with a downward trend for the consecutive 26 trading days from 1 December 2017. It is observed that the new SFEA ruling by BNM from 5 December 2016 could not lift the value of MYR after it was implemented as the external environment was still very volatile. The key questions are: Are all inward FDIs respond to the new ruling favourably?

This foreign exchange administration rule is new and has never been studied before. Therefore, it is crucial to evaluate the policy effectiveness of the SFEA Rule towards strengthening the Ringgit.

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<sup>3</sup> Refer to Supplementary Notice on Foreign Exchange Administration Rules – dated 2 Dec 2016.  
[http://www.bnm.gov.my/index.php?ch=en\\_announcement&pg=en\\_announcement&ac=481&lang=en](http://www.bnm.gov.my/index.php?ch=en_announcement&pg=en_announcement&ac=481&lang=en)



Notes: An Index is built with an initial value of 100 on 1 December 2017 (author's computation)  
 Sample period: 1/12/2016 to 5/1/2017.  
 The exchange rate on 1/12/2016 served as a base rate to compute the index.  
 MYR USD denotes Ringgit Malaysia to US Dollar exchange rate (RM 1 equal to USD).  
 VNDUSD denotes Vietnamese Dong to US Dollar exchange rate (VND 1 equal to USD).  
 IDRUSD denotes Indonesia Rupiah to US Dollar exchange rate (IDR 1 equal to USD).  
 PHP USD denotes Philippine Peso to US Dollar exchange rate (PHP 1 equal to USD).  
 THDUSD denotes Thai Baht to US Dollar exchange rate (THD 1 equal to USD).  
 Source: Thomson Reuters Data Stream.

**Figure 1: Exchange rate index movement of selected ASEAN countries.**

Notably, in the post-new exchange rule period, our results indicate that: Firstly, Japanese FDI is found to strengthen the Ringgit Malaysia; Secondly, FDI from Singapore exert depreciation pressure on Ringgit Malaysia; Thirdly, FDI from China, the Netherlands and the United States are insignificant in influencing the Ringgit Malaysia. The empirical results suggest that the new SFEA Rule has caused the Japanese FDI to exert upward pressure on the value of Ringgit Malaysia. The export-oriented Japanese FDI improves the performance of the export sector through efficient allocation of resources, higher capacity utilisation and exploitation of economies of scale. Therefore, the paper reveals that not all FDI will bring a positive impact on Ringgit Malaysia. Furthermore, the results obtained are robust to different measures of the exchange rate.

The rest of the paper is arranged as follows. Section two discusses the literature and identifies the research gap, theoretical model and hypothesis development. Section three describes data and methodology, followed by a discussion of the result. The last section concludes the study.

## 2.0 Literature review

In literature, imposing capital control constitutes one of the last resorts to control exchange rate movement. It enables the government to limit the speculation of local currency. Although capital control might seem too heavy to smoothen the exchange rate returns, many countries use them to control speculation. (de Grauwe, 2000; von Hagen & Zhou, 2005).

However, an earlier study in Chile by Herrera & Valdes (2001) found that the effect of the Chilean capital controls on the exchange rate was limited. Their conclusion was supported by De Gregorio et al. (2000). In the latter, they use the VAR model to examine the effectiveness of Chilean control on the real interest rate.

On Australian data, Kim et al. (2000) investigate the effectiveness of daily foreign exchange intervention on the US Dollar to Australian Dollar exchange rate from 1983 to 1997. They found a contemporaneous and positive correlation between the direction of intervention and the conditional mean and variance of exchange rate return. Their paper suggests that sizeable foreign exchange intervention in Australia stabilises the influence of the foreign exchange market in terms of direction and volatility.

However, a later study by Edison et al. (2003) has mixed results. Using data from 1984 to 2001, they find that foreign exchange intervention had some success in moderating the depreciation of the Australian Dollar but at the same time led to more exchange rate volatility. Accordingly, they conclude that foreign exchange intervention in Australia is relatively modest on both the level and volatility of the Australian Dollar exchange rate.

Using Malaysian data from 1998, Edison & Reinhart (2001) conclude that capital control promotes exchange stability and more policy autonomy. Conversely, Tamirisa (2004) uses a simple error-correction model to examine the macroeconomic effect of Malaysia's capital account regulation from January 1991 to December 2002 and find that capital control generally has an insignificant effect on the exchange rate. However, it is found that control on portfolio outflow, bank, and foreign exchange operation reduce the interest rate.

A study by Pattanaik & Satyananda (2003) on Indian data found that foreign exchange intervention conducted by Central Bank has been effective in containing exchange rate volatility. Subsequently, Domac & Mendoza (2004) and Guimaraes & Karacada (2004) find similar results in Mexico and Turkey. Furthermore, Stone et al. (2009) support this claim by investigating the foreign exchange intervention in Brazil from 2007 to 2009.

Using the univariate and multivariate model to study the pressure of foreign exchange intervention from 1994 to 2007, Humala & Rodriguez (2010) find that foreign exchange intervention in the form of foreign exchange purchase or sale succeeds in reducing the Peruvian exchange rate volatility. Another study by Rossini et al. (2013) concludes that sterilised intervention in the foreign exchange market in Peru (1999-2012) succeeds in reducing exchange rate volatility.

Based on the literature review above, there is a clear research gap. There has not been any previous study on Foreign Exchange Administration Rule like the one imposed by the Central Bank of Malaysia on FDIs. Hence, this study will fill the gap by providing new evidence on the effectiveness of this policy measure. In addition, there is a need to build a theoretical model to investigate the relationship between FDI and the exchange rate in section 2.1.

## 2.1 Theoretical model

### Exchange rate model for Malaysia

The standard models of the exchange rate are based on a few macroeconomic variables such as prices, interest rates, and output, as commonly used by researchers, as Engle et al. (2007) discussed. As a refinement, this paper deviates from the standard exchange rate models by selecting macroeconomic indicators on which Malaysia's economy is heavily relied upon. As such, this study uses crude oil price, the inflow of portfolio investment and international reserve.

Moreover, this study also includes the foreign direct investment from countries with the highest cumulative FDI in Malaysia in 2017, namely Singapore, Japan, China, the Netherlands and the United States. This FDI data is published by the Ministry of International Trade and Industry (MITI) and the Department of Statistics Malaysia (DOSM) (The Star, 2018).

Accordingly, the mathematical function can be expressed as below:

$$\text{MYRUSD} = f(\text{Crude}, \text{Portfolio}, \text{Reserve}, \text{FDI\_SG}, \text{FDI\_JP}, \text{FDI\_CH}, \text{FDI\_NL}, \text{FDI\_US})$$

Where:

MYRUSD denotes Malaysian Ringgit to US Dollar exchange rate;

Crude denotes crude oil price (USD per barrel);

Portfolio denotes inflow of portfolio investment (Million USD);

Reserve denotes international reserve (Million USD);

FDI\_SG, FDI\_JP, FDI\_CH, FDI\_NL and FDI\_US denote country-specific FDI (in a million MYR) from Singapore, Japan, China, Netherlands and United States, respectively

In terms of the choice of variables, crude oil price (Crude) is used as an indicator to gauge the performance of MYR. It is widely perceived that the value of MYR tracks the crude oil price movement. Therefore, higher crude oil price tends to strengthen the Ringgit Malaysia or vice versa. For instance, in mid-2016, Ringgit Malaysia depreciated sharply on the back of falling global crude oil prices (MIDF, 2017). Hence, the crude oil price is a suitable variable to gauge the performance of Ringgit Malaysia.

Second, there exist strong linkages between portfolio investment and MYR. An influx of foreign portfolio investment improves local stocks and local currency demand, leading to higher stock prices and liquidity. Historically, the returning tide of foreign money into local bond and equity markets help to strengthen the local currency against foreign currencies (Idris, 2016). Concerning this, the inflow of portfolio investment is added to the model to track the performance of Ringgit Malaysia.

Third, the international reserve is a good predictor of local currency movement. Existing literature demonstrates that a high level of international reserve tends to reduce the likelihood of a currency crisis or a "sudden stop". That "sudden stop" is a sudden unwillingness by international lenders to renew their credit lines at times of market uncertainty (see Calvo & Reinhart, 1999; Caramazza, Ricci & Salgado, 2004). In addition, the higher reserve level tends to improve public confidence in the local currency and minimise the probability of being exposed to currency risk.

## 2.2 Hypothesis

Based on the discussion on the model, this study intends to investigate the impact of the new SFEA rule on the relationship between Ringgit Malaysia and FDI. Hence, it can be hypothesised that:

- H1: Foreign Direct investment from Singapore further strengthens the Ringgit Malaysia with the new exchange rule.
- H2: Foreign Direct investment from Japan further strengthens the Ringgit Malaysia with the new exchange rule.
- H3: Foreign Direct Investment from China further strengthens the Ringgit Malaysia with the new exchange rule.
- H4: Foreign Direct Investment from the Netherlands further strengthens the Ringgit Malaysia with the new exchange rule.
- H5: Foreign Direct investment from the United States further strengthens the Ringgit Malaysia with the new exchange rule.

Under the new SFEA Rule, exporters must convert 75 per cent of their export proceeds to local currency Ringgit with one of the onshore financial institutions. The primary interest of this paper is to investigate whether the new ruling will enable FDI to influence the value of Ringgit as intended by the policy. In this respect, the inward FDI figures of the top five countries with the highest cumulative FDI in Malaysia in 2017 will be used in this study.

Hypothesis 1 to 5 are set to confirm that the FDI from the five countries will further strengthen the Ringgit Malaysia on the back of the new foreign exchange rule. It is believed that the influx of FDI will increase the demand for local currency, leading to a higher appreciation in Ringgit Malaysia.

## 3.0 Data and methodology

### 3.1 Data

This study uses monthly data from September 2015 to February 2018. Next, using the dummy variable approach, the sample period can be further divided into a pre-SFEA rule (September 2015 to November 2016) and a post-SFEA rule (December 2016 to February 2018). All series are transformed into a natural logarithm before the estimation. The variables used are shown in Table 1.

Before the model estimation, correlation analysis has been used to check whether the key explanatory variables are highly correlated. Table 2 presented the corresponding results and found a high correlation between country-specific foreign direct investments in Malaysia. For instance, the correlation between LnFDI\_CH and LnFDI\_SG is -0.70, followed by LnFDI\_CH and LnFDI\_US with a correlation of 0.68. This observation implies that the country-specific foreign direct investment should model separately to prevent the multicollinearity problem in the model.

Table 1: List of variables

Variables	Descriptions	Unit of measurement	Sources
MYRUSD	Malaysia Ringgit to US Dollar Exchange rate	Exchange rate	MSCI
Crude	Tapis crude oil price	USD per barrel	Data Stream
Portfolio	The inflow of portfolio investment	Million USD	Data Stream
Reserve	International reserve	Million USD	BNM
FDI_SG	Foreign direct investment from Singapore	Million MYR	BNM
FDI_JP	Foreign direct investment from Japan	Million MYR	BNM
FDI_CH	Foreign direct investment from China	Million MYR	BNM
FDI_NL	Foreign direct investment from the Netherlands	Million MYR	BNM
FDI_US	Foreign direct investment from the United States	Million MYR	BNM
<b>Variable for robustness check</b>			
REER	Real effective exchange rate	Index	IMF

Notes: Sample period: September 2015 to February 2018. All the data used are in monthly frequency.

MSCI denotes Morgan Stanley Capital International. IMF denotes International Monetary Fund.

Data Stream denotes Thomson Reuters DataStream. BNM denotes Bank Negara Malaysia.

Tapis crude oil price is a Malaysian crude oil used as a pricing benchmark in Singapore, and it is often used as an oil market for Asia and Australia.

Table 2: Correlation matrix

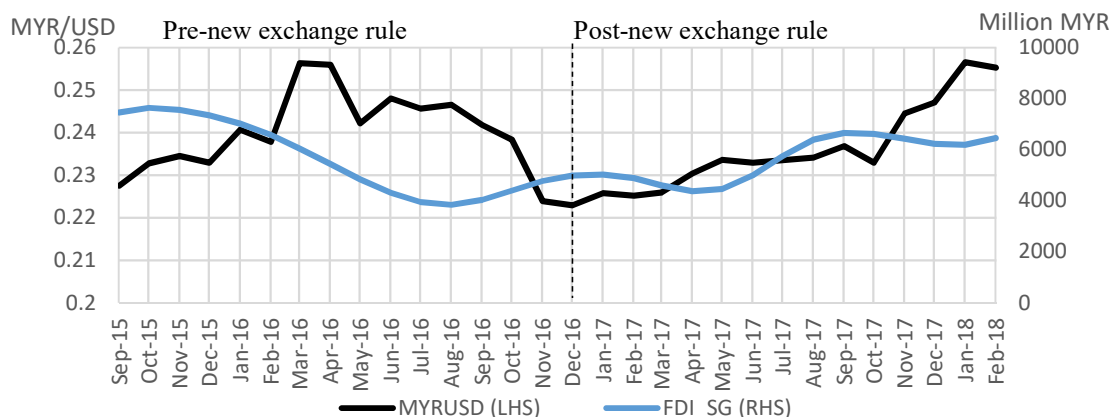
	Crude	Portfolio	Reserve	FDI_SG	FDI_JP	FDI_CH	FDI_NL	FDI_US
Crude	1.00							
Portfolio	-0.22 (0.23)	1.00						
Reserve	0.56 (0.00)	-0.55 (0.00)	1.00					
FDI_SG	0.04 (0.85)	0.16 (0.40)	0.05 (0.81)	1.00				
FDI_JP	0.39 (0.03)	0.27 (0.15)	-0.12 (0.51)	-0.29 (0.12)	1.00			
FDI_CH	0.01 (0.94)	0.36 (0.05)	-0.22 (0.25)	-0.70 (0.00)	0.59 (0.00)	1.00		
FDI_NL	-0.27 (0.14)	-0.16 (0.41)	-0.14 (0.47)	-0.30 (0.10)	-0.33 (0.07)	0.04 (0.82)	1.00	
FDI_US	-0.32 (0.09)	0.33 (0.08)	-0.58 (0.00)	-0.58 (0.00)	0.34 (0.07)	0.68 (0.00)	0.56 (0.00)	1.00

Notes: Sample period: September 2015 to February 2018.

All series above is transformed into a natural logarithm.

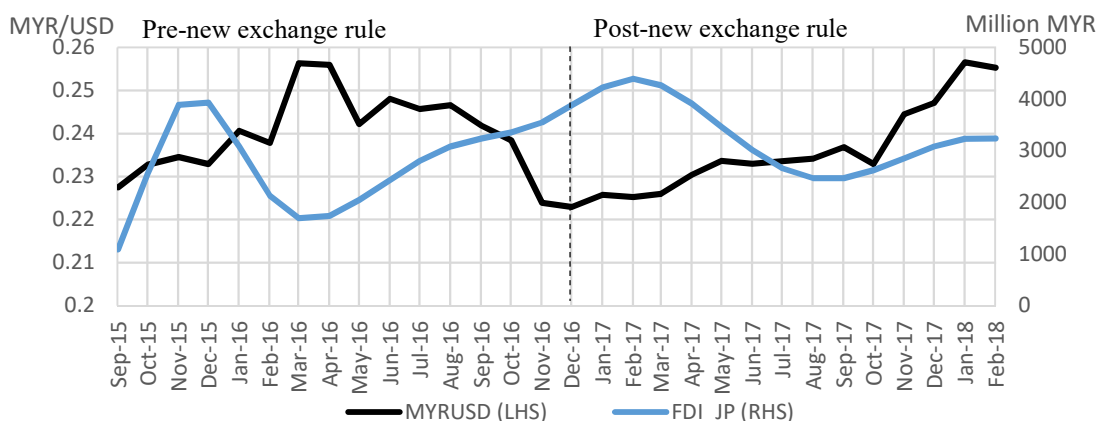
Values in parenthesis are p-value.

Figures 2 to 6 show the trend of MYRUSD with FDI\_SG, FDI\_JP, FDI\_CH, FDI\_NL and FDI\_US. Notably, the new exchange rule has succeeded in strengthening the Ringgit Malaysia. As such, MYRUSD appreciated substantially after the introduction of the new exchange rate policy. Meanwhile, direct investment from Singapore has increased gradually since introducing the new foreign exchange rule (Figure 2).



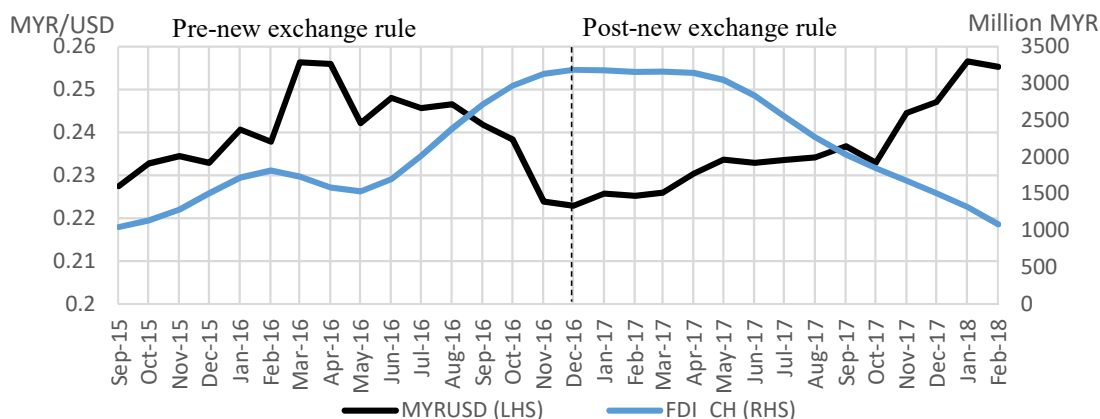
Notes: Pre-SFEA Rule: September 2015 to November 2016.  
 Post-SFEA Rule: December 2016 to February 2018.  
 Source for MYRUSD: MSCI. Source for FDI\_SG: BNM.

**Figure 2: Monthly trend of MYRUSD and Singapore FDI**



Notes: Pre-SFEA Rule: September 2015 to November 2016.  
 Post-SFEA Rule: December 2016 to February 2018.  
 Source for MYRUSD: MSCI. Source for FDI\_JP: BNM.

**Figure 3: Monthly trend of MYRUSD and Japanese FDI**

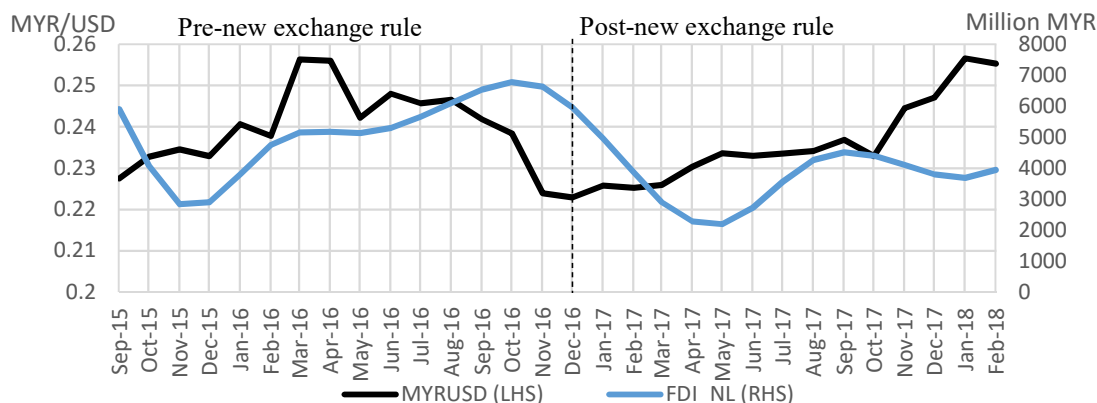


Notes: Pre-SFEA Rule: September 2015 to November 2016.  
 Post-SFEA Rule: December 2016 to February 2018.  
 Source for MYRUSD: MSCI. Source for FDI\_CH: BNM.

**Figure 4: Monthly trend of MYRUSD and China FDI**

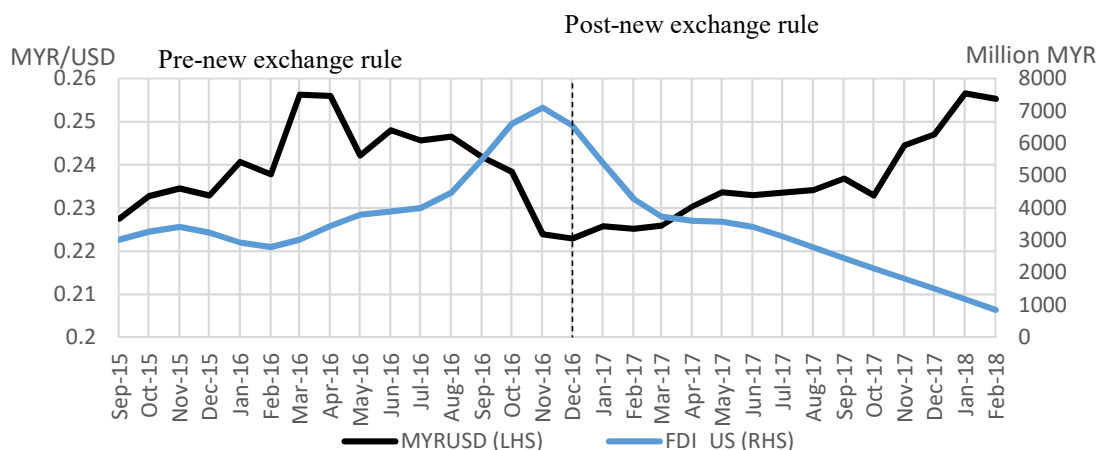


Next, interestingly, foreign direct investment from Japan declined after a few months of the new exchange rule, but it started to rebound in late 2017 and is an increasing trend (figure 3). Similarly, direct investment from the Netherlands declined right after the new exchange rule and rebound in mid-2017 (figure 5). Furthermore, direct investment from China and the United States declined substantially with the new exchange rate rule (Figures 4 and 6).



Notes: Pre-SFEA rule is from September 2015 to November 2016.  
 Post-SFEA rule: December 2016 to February 2018.  
 Source for MYRUSD: MSCI. Source for FDI\_NL: BNM.

**Figure 5: Monthly trend of MYRUSD and Netherland FDI**



Notes: Pre-SFEA Rule: September 2015 to November 2016.  
 Post-SFEA Rule: December 2016 to February 2018.  
 Source for MYRUSD: MSCI. Source for FDI\_US: BNM.

**Figure 6: Monthly trend of MYRUSD and United States FDI**

### 3.2 Methodology

#### 3.2.1 Model specification

The models are specified as below:

$$\text{Model 1: } \ln MYRUSD_t = B_0 + B_1 \ln Crude_t + B_2 \ln Portfolio_t + B_3 \ln Reserve_t + \varepsilon_t$$

$$\text{Model 2: } \ln MYRUSD_t = B_0 + B_1 \ln Crude_t + B_2 \ln Portfolio_t + B_3 \ln Reserve_t + B_4 \ln FDI\_SG_t + B_5 Rule + B_6 Rule * \ln FDI\_SG_t + \varepsilon_t$$

$$\text{Model 3: } \ln\text{MYRUSD}_t = B_0 + B_1 \ln\text{Crude}_t + B_2 \ln\text{Portfolio}_t + B_3 \ln\text{Reserve}_t + B_4 \ln\text{FDI\_JP}_t + B_5 \text{Rule} + B_6 \text{Rule} * \ln\text{FDI\_JP}_t + \varepsilon_t$$

$$\text{Model 4: } \ln\text{MYRUSD}_t = B_0 + B_1 \ln\text{Crude}_t + B_2 \ln\text{Portfolio}_t + B_3 \ln\text{Reserve}_t + B_4 \ln\text{FDI\_CH}_t + B_5 \text{Rule} + B_6 \text{Rule} * \ln\text{FDI\_CH}_t + \varepsilon_t$$

$$\text{Model 5: } \ln\text{MYRUSD}_t = B_0 + B_1 \ln\text{Crude}_t + B_2 \ln\text{Portfolio}_t + B_3 \ln\text{Reserve}_t + B_4 \ln\text{FDI\_NL}_t + B_5 \text{Rule} + B_6 \text{Rule} * \ln\text{FDI\_NL}_t + \varepsilon_t$$

$$\text{Model 6: } \ln\text{MYRUSD}_t = B_0 + B_1 \ln\text{Crude}_t + B_2 \ln\text{Portfolio}_t + B_3 \ln\text{Reserve}_t + B_4 \ln\text{FDI\_US}_t + B_5 \text{Rule} + B_6 \text{Rule} * \ln\text{FDI\_US}_t + \varepsilon_t$$

where

Ln	Natural logarithm
MYRUSD	Ringgit Malaysia to US Dollar exchange rate (RM 1 equal to USD)
Crude	Crude oil price (USD per barrel)
Portfolio	Inflow of portfolio investment (Million USD)
Reserve	International reserve (Million USD)
FDI_SG	Foreign direct investment from Singapore (Million MYR)
FDI_JP	Foreign direct investment from Japan (Million MYR)
FDI_CH	Foreign direct investment from China (Million MYR)
FDI_NL	Foreign direct investment from Netherlands (Million MYR)
FDI_US	Foreign direct investment from United States (Million MYR)
Rule=1	Sample period from December 2016 to February 2018. (After the implementation of the new exchange rate policy).
Rule=0	Sample period from September 2015 to November 2016. (Before the implementation of the new exchange rate policy).

Ordinary Least Square (OLS) is used to estimate the above models. Model 1 acts as a base model. The correlation matrix in Table 2 reveals pairs of countries with higher correlation in FDIs, for example, Singapore and China (-0.70); China and the US (0.69). Hence, the country-specific foreign direct investment has been modelled separately from Model 2 to Model 6 to avoid multicollinearity.

Furthermore, the dummy interaction term has been added to demonstrate the impact of the direct investment from different countries on Ringgit Malaysia in the post-new exchange rate rule.

As mentioned, of primary interest of this study is the impact of the new exchange rule on the relationship between Ringgit Malaysia and direct investment from Singapore (FDI\_SG), Japan (FDI\_JP), China (FDI\_CH), the Netherlands (FDI\_NL) and the United States (FDI\_US). Therefore, the focus of this study is on the dummy of the interaction term.

A priori assumption that  $\text{Rule} * \ln\text{FDI\_SG}_t$ ,  $\text{Rule} * \ln\text{FDI\_JP}_t$ ,  $\text{Rule} * \ln\text{FDI\_CH}_t$ ,  $\text{Rule} * \ln\text{FDI\_NL}_t$  and  $\text{Rule} * \ln\text{FDI\_US}_t$  exhibit a positive coefficient. This observation indicates that the direct investment from the five countries will positively affect Ringgit Malaysia with the new foreign exchange rule. The new exchange rule is found to reduce Ringgit volatility (Wong, 2017). Therefore, foreign firms are more willing to invest in Malaysia as currency risk is minimised.

### 3.2.2 Cubic Spline Interpolation

Cubic spline interpolation is one of the useful methods for converting economic indicators from one frequency to another time-frequency. For this study, quarterly data has been converted to monthly data for FDI and portfolio investment. Software known as SRS1 Cubic Spline is used. This interpolation method is almost similar to the Chow-Lin procedure (1971) (Fernandez, 1981; Litterman, 1983; Harvey and Pierse, 1984; Guerrero, 1990).

## 4.0 Results and Discussion

### 4.1 Descriptive statistics

As shown by Table 3, among the country-specific FDI, LnFDI\_SG is the least volatile with the lowest standard deviation. In contrast, LnFDI\_US exhibits the highest standard deviation. This number implies that the LnFDI\_US is the most volatile series among the country-specific FDI.

Table 3: Descriptive statistics

Variables	Mean	Standard deviation	Skewness	Kurtosis	J-B statistic	Obs
LnMYRUSD	-1.43	0.04	0.31	2.18	1.32(0.51)	30
LnCrude	3.93	0.17	-0.15	3.06	0.12(0.93)	30
LnPortfolio	7.71	0.08	-1.04	3.44	5.73(0.05)	30
LnReserve	11.49	0.03	0.81	2.71	3.38(0.18)	30
LnFDI_SG	8.62	0.21	-0.07	1.71	2.12(0.35)	30
LnFDI_JP	7.96	0.31	-1.14	4.54	9.51(0.01)	30
LnFDI_CH	7.61	0.36	-0.16	1.79	1.94(0.38)	30
LnFDI_NL	8.36	0.31	-0.46	2.42	1.48(0.48)	30
LnFDI_US	8.08	0.47	-0.84	4.03	4.85(0.09)	30
LnREER	4.48	0.02	0.61	2.24	2.58(0.27)	30

Notes: Sample period: September 2015 to February 2018.

Ln denotes that all series have been transformed to the natural logarithm.

The value in parentheses is the p-value.

### 4.2 Ordinary Least Square

Table 4 presents the result of the OLS for all models. Model 1 shows that the Crude Oil and Portfolio weaken the LnMYRUSD by 0.11 and 0.15 per cent, respectively.

Contrary to the perception held by many, crude oil has no direct impact on MYRUSD as Malaysia has been a net importer of oil since 2014, as revealed by the former Secretary-General of the Ministry of Finance. Moreover, as per the report, Malaysia's net exports of crude oil have been on a declining trend since 2005. For example, Malaysia produced 60,000 barrels per day in 2005 but only had 48,000 barrels daily in 2014.<sup>4</sup>

Interestingly, Malaysia exports its premium Tapis crude oil and imports low-grade oil to refine its downstream facilities.<sup>5</sup> However, net imports of petroleum products are more than the net exports, resulting in a difference of RM 1.2 billion. This finding explains that crude oil price has an adverse effect on the Ringgit.

<sup>4</sup> <https://www.thestar.com.my/business/business-news/2015/01/21/clearing-the-air-treasury-sec-gen-malaysia-net-importer-of-crude-oil-petroleum-products-since-2014> (retrieved on 30 July 2019)

<sup>5</sup> <https://www.export.gov/article?id=Malaysia-Oil-and-Gas-Equipment> (retrieved on 30 July 2019)

The latter can be attributed to the inflow of hot money into the domestic stock market. The figure is volatile as the inflow and outflow of portfolio money are subjected to many reasons. The net outflow may have caused Ringgit to depreciate. In contrast, Reserve is found to strengthen the MYRUSD by 0.86 per cent.

Table 4: Ordinary Least Square (OLS) results. Dependent variable: LnMYRUSD

Independent variable	Model					
	(1)	(2)	(3)	(4)	(5)	(6)
LnCrude	-0.11** (0.01)	-0.01 (0.83)	-0.08* (0.07)	-0.05 (0.41)	-0.02 (0.73)	0.03 (0.64)
LnPortfolio	-0.02* (0.07)	-0.01 (0.18)	-0.01 (0.15)	-0.01 (0.58)	-0.01 (0.58)	0.01 (0.95)
LnReserve	0.86** (0.01)	1.82*** (0.00)	1.89*** (0.00)	1.03 (0.14)	1.23*** (0.00)	1.55*** (0.00)
LnFDI_SG		0.06 (0.11)				
LnFDI_JP			-0.04** (0.01)			
LnFDI_CH				-0.03 (0.35)		
LnFDI_NL					-0.02 (0.51)	
LnFDI_US						-0.08** (0.04)
Rule		2.17** (0.03)	-1.82*** (0.00)	0.01 (0.99)	-0.09 (0.79)	-0.83 (0.19)
Rule*LnFDI_SG		-0.26** (0.03)				
Rule*LnFDI_JP			0.22*** (0.00)			
Rule*LnFDI_CH				-0.01 (0.96)		
Rule*LnFDI_NL					0.01 (0.92)	
Rule*LnFDI_US						0.09 (0.21)
Constant	-10.81*** (0.00)	-22.78*** (0.00)	-22.43*** (0.00)	-12.74 (0.11)	-15.22*** (0.00)	-18.71** (0.02)
Adjusted R square	0.43	0.62	0.78	0.58	0.54	0.64
DW-statistics	0.80	1.30	1.91	1.19	1.19	1.11
Breusch-Pagan test	9.25**	7.54	10.92	5.27	7.58	5.75
F-statistics	8.38***	8.92	18.17***	7.70***	6.73***	9.77***
Observations	30	30	30	30	30	30

Notes: The asterisk \*\*\*, \*\* and \* denotes statistical significance at 1%, 5% and 10 % level respectively.

Values in parenthesis are p-value. Sample period: September 2015 to February 2018,

Ln denotes all series have been transformed into the natural logarithm,

For Model 2, the dummy interaction term shows that the FDI\_SG weakens the MYRUSD by 0.26 per cent with the new SFEA Rule. In addition, the dummy interaction term provides the indirect effect of the FDI to Ringgit Malaysia. In other words, the direct effect of the impact of FDI\_SG is negative by 0.2 per cent (0.06-0.26). This number indicates that Ringgit Malaysia responds negatively concerning an increase in the FDI from Singapore. Therefore, H1 cannot be accepted.

Table 5: Robustness check for OLS results. Dependent variable: LnREER

Independent variable	Model					
	(1)	(2)	(3)	(4)	(5)	(6)
LnCrude	-0.05** (0.03)	-0.01 (0.86)	-0.05*** (0.00)	-0.03 (0.44)	-0.01 (0.72)	-0.01 (0.75)
LnPortfolio	-0.01** (0.04)	-0.01 (0.18)	-0.01*** (0.00)	-0.01 (0.28)	0.01 (0.28)	-0.01 (0.38)
LnReserve	0.46*** (0.00)	0.94*** (0.00)	1.05*** (0.00)	0.44 (0.27)	0.58*** (0.00)	0.51 (0.22)
LnFDI_SG		0.01 (0.56)				
LnFDI_JP			-0.02*** (0.00)			
LnFDI_CH				-0.01 (0.87)		
LnFDI_NL					0.01 (0.78)	
LnFDI_US						-0.01 (0.53)
Rule		1.01* (0.06)	-1.16*** (0.00)	0.12 (0.76)	0.11 (0.55)	-0.07 (0.85)
Rule*LnFDI_SG		-0.12* (0.06)				
Rule*LnFDI_JP			0.14*** (0.00)			
Rule*LnFDI_CH				-0.02 (0.73)		
Rule*LnFDI_NL					-0.02 (0.47)	
Rule*LnFDI_US						0.01 (0.89)
Constant	-0.56 (0.74)	-6.31** (0.02)	-7.22*** (0.00)	-0.38 (0.93)	-2.16 (0.25)	-1.22 (0.80)
Adjusted R square	0.47	0.61	0.85	0.52	0.51	0.53
DW-statistics	0.64	1.11	2.00	0.83	0.93	0.86
Breusch-Pagan test	7.34	4.21	5.54	5.62	5.56	4.52
F-statistics	9.71***	8.45***	29.27***	6.13***	6.11***	6.52***
Observations	30	30	30	30	30	30

Notes: The asterisk \*\*\*, \*\* and \* denotes statistical significance at 1%, 5% and 10 % level respectively.

Values in parenthesis are p-value. Sample period: September 2015 to February 2018,

Ln denotes all series have been transformed into the natural logarithm,

In Model 3, the dummy interaction term demonstrates that the FDI\_JP further strengthens the MYRUSD by 0.22 per cent relative to the pre-exchange rule period. Moreover, model 3 also shows that the new exchange rule changes the responsiveness of Ringgit Malaysia toward the FDI from Japan.

Notably, before the exchange rule, an increase in the LnFDI\_JP would lead to 0.04 per cent depreciation in MYRUSD. However, the new exchange rule has enabled the FDI\_JP to increase the value of the local currency. An increase in the FDI\_JP will strengthen the MYRUSD by 0.18 per cent ( $-0.04+0.22$ ). Hence, H2 is strongly supported at a 1 per cent significance level.

Model 4 demonstrates that the LnFDI\_CH has no influence on the MYRUSD in the pre-new exchange rule. Moreover, the dummy interaction term is not significant as well. This finding further indicates that the LnFDI\_CH plays no role in influencing the Ringgit Malaysia. Hence, H3 cannot be accepted.

In Model 5, the dummy interaction term is found to be insignificant. This result implies that MYRUSD is irresponsive concerning any changes in the direct investment from the Netherlands (LnFDI\_NL) in the post-new exchange rule period. Therefore, H4 cannot be accepted.

Similarly, for Model 6, the dummy interaction term demonstrates that the direct investment from the United States (LnFDI\_US) has no role in influencing the MYRUSD in the post-new exchange rule period. Thus, H5 cannot be accepted.

Another estimation has been conducted by using alternative exchange rate measures to ensure the robustness of the result. As such, the MYRUSD is replaced by the real effective exchange rate (REER). The results are shown in Table 5. Overall, the results are consistent with the findings in Table 4, in which the Japanese FDI strengthens the ringgit performance in the post-new exchange rule. Similarly, FDI from Singapore is found to depreciate the ringgit value. Likewise, FDI from China, the Netherlands and the United States have no impact on the ringgit performance in the post-new exchange rule period.

### 4.3 Policy Implication

By relocating production capacities of matured industries into developing countries, Japanese Multinational Enterprises (MNEs) can combine their advantages in technology and lower production costs of host countries to strengthen their global competitiveness. The brand name recognition and well-connected global distribution network enable Japanese firms to export their products from host countries. In contrast, the US MNEs extend their oligopoly power into the local market, in which this strategy is not the prime objective of Japanese MNEs in developing countries (Xing, 2006).

Kojima (1978) refers to this pattern as the Japanese model of foreign direct investment. An influx of FDI from Japan provides advanced technology in assisting domestic production, thereby achieving economies of scale and reducing production costs among local firms, leading to their greater competitiveness in international transactions. Subsequently, these higher exports increase the country's economic growth. In turn, the domestic currency will appreciate its value. Moreover, with the new exchange rule, the higher the exports, the higher the number of export earnings is required to convert into Ringgit Malaysia. Consequently, the new

exchange rule further strengthens the Ringgit Malaysia due to the increase in the FDI from Japan.

Next, FDI from Singapore is found to weaken the Ringgit Malaysia in pre and post-new exchange rules. Traditionally, the FDI from Singapore was concentrated in Malaysia's property market (Maierbrugger, 2017). Given this model of FDI, it may inflate the price of the property in Malaysia economy through the import channel. Subsequently, higher property price reduces the competitiveness of the domestic property market, leading to depreciation in the local currency.

For instance, the influx of FDI from Singapore increases the import volume as the contractors import raw materials to construct houses and condominiums. As a result, domestic property prices using imports as raw materials also increase, causing an increase in the general prices of all goods and services.

This finding is valid in Malaysia, in which the imbalances in the property market remain a contentious issue, attributed to the higher price level in the property market. Given this high price in the domestic property market, purchasers will shift their preferences to the foreign property market, offering lower property prices. Consequently, Ringgit Malaysia depreciates.

## 5.0 Conclusions

This study examines the relationship between FDI and Ringgit Malaysia under the Supplemental Foreign Exchange Administration (SFEA) Rule implemented in December 2016. One significant contribution of the paper is identifying which country-specific FDI will strengthen the Ringgit on the back of the new rule.

In the post-new exchange rule period, our results indicate that: Firstly, Japanese FDI is found to strengthen the Ringgit Malaysia; Secondly, FDI from Singapore exerts depreciation pressure on Ringgit Malaysia; Thirdly, FDI from China, the Netherlands and the United States are insignificant in influencing the Ringgit Malaysia. Notably, the results obtained are robust to different measures of the exchange rate.

The empirical results suggest that the new SFEA Rule has caused the Japanese FDI to exert upward pressure on the value of Ringgit Malaysia. The export-oriented Japanese FDI improves the performance of the export sector through efficient allocation of resources, higher capacity utilisation and exploitation of economies of scale. Therefore, the paper reveals that not all FDI will bring a positive impact on Ringgit Malaysia.

Two policies are suggested: Firstly, Bank Negara Malaysia, as Foreign Exchange controller, needs to devise a strategy for non-export oriented FDI to strengthen the MYR; Secondly, our evidence also shows the importance of export-oriented industry for the Malaysian economy. Hence, more measures should be taken by the Ministry of Trade and Industry to incentivise the inflow of high value-added and export-oriented manufacturing investments to Malaysia.

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