

## **Parity and Non-parity Determinants of Malaysia Ringgit: Evidence from Major Trading Partners**

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### **ABSTRACT**

The heavy slump of MYR arouses research interest in studying potential non-parity factors that affects MYR. Due to the limited empirical evidence stressed on non-parity factors, the objective of study aims to examine the effect of non-parity factors and parity factors on MYR for enriching existing literature by adding new empirical evidence. Inconsistent with the literature, the positive effects of current account balance and trade openness on MYR are found across most major trade currency pairs. It is contended that the finding may be subject to country-specific-factors requires future research endeavour.

Keywords: exchange behaviour, Purchasing Power Parity, currency, Malaysia Ringgit

### **1. INTRODUCTION**

Since the abandonment of the pegged system in July 2005, the Malaysia Ringgit (MYR) had experienced several episodes of significant exchange rate fluctuations relative to its major trading partners. The Star in October 2015 reported that there is a clear evidence of significant MYR depreciation against its major trading partners. More recently, the New Straits Times on 31 December 2016<sup>1</sup> reported that the Ringgit suffered a bumpy ride and an excruciating journey throughout 2016. On the 20<sup>th</sup> December 2016, the ringgit touched 4.4790 against the US dollar at one point, the weakest level since the Asian financial crisis.

Kandil (2004) and Dell'Archia, (1999) argued that exchange rate fluctuations had undesirable impact on international trade which eventually will affect the countries' economy. Hericourt and Poncet (2012) contended that firm's decision to export to certain countries deteriorate as the exchange rate volatility increased. A Global Credit Research conducted by Moody's Investor Service in September 2015 found that the market participants viewed that the MYR volatility as the second largest risk for Malaysia's economic. Corporations experienced declining revenue from their export due to MYR depreciation, increasing capital outflow and worsening investor sentiment towards Malaysia. Thus, this research problem deserves to be studied because of its national importance as it is not barely for business but public concern. The study intends to close the industry gap by providing useful insight and increase the policy

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<sup>1</sup> News Straits Times on 31<sup>st</sup> December 2016 reported that the Ringgit depreciated by 4.53% to end of 2016 4.4845/4.4875 against US Dollar compared to 4.2900/4.2970 in 2015.

makers' understanding on: the MYR exchange behaviour over time, and the impact of non-parity factors on the MYR exchange behaviour.

Numerous studies in literature examined the MYR exchange behaviour either a single country or a group of countries. Most studies find that the parity factors especially the PPP does not hold in Malaysia (Ho & Ariff, 2008a; Chua & Bauer, 1995; Ho & Ariff, 2009) mainly due to Sticky Price Hypothesis (Dornsbuch, 1976). However, Kit and Lan (2015) and Gharleghi and Nor (2012) argued that PPP need a long-run horizon in order for the relationship with the exchange rates behaviour to be existed.

Likewise, studying the relationship of non-parity factors and MYR exchange behaviour either a single country (Hsing, 2015; Lee & Law, 2013; Wong, 2012; and Chua & Bauer, 1995) or a group of countries (Tsai, 2012; Bock & Filho, 2015; Wong, 2009 and Ho & Ariff, 2008a) also had been conducted. In these studies, among the non-parity determinants that showed significant impact to the MYR behaviour were stock market index, trade openness, oil price, reserves, growth rate, monetary expansion and fiscal balances. However, to the best of our knowledge, there is limited study on how the non-parity factors accentuate the dynamics of MYR since it was unpegged to USD in July 2005. Hence, this study intends to provide additional insight by studying how the non-parity factors had shaped the MYR behaviour since the Managed Float System from 2006 to 2016.

Most previous research (Gharleghi & Nor, 2012; Poukalbassi, Bahiraie, Hamzah & Chin, 2011; Hsing, 2015; Lee & Law, 2013; Wong, 2012; Chua & Bauer, 2011; Wong, 2009 and Ho & Ariff, 2008a) only focused on the determinants of exchange rate behaviour of MYR against the USD. Thus far, only Baharumshah, MacDonald and Mohd (2010) had studied on the determinants of MYR exchange behaviour against Japanese Yen (JPY) and USD. Examining the MYR exchange behaviour against its major trading partners is meaningful by adding new knowledge on the non-parity factors of MYR exchange behaviour against six major trading partners' currencies after the MYR unpegged to USD in 2005. This may also help the policy maker in designing favourable and robust term of trade that has a positive impact on MYR in the future. Six Malaysia's major trading partners, which are China, Singapore, United Kingdom (UK), USA, Japan and Thailand, are selected in this study as they represent an aggregate of approximately 60% of total trade of Malaysia, as shown in figure 1.

**Figure 1: Percentage share of Total Trade by Major Countries, January 2017**



Source: Department of Statistics, Malaysia

## 2. SIGNIFICANCE OF STUDY

The study explores the associations between non-parity factors and MYR for the period of 10 years after the MYR was unpegged to USD. This study extends the past research work of Ariff and Zarei (2016) who had examined the relationship between parity and non-parity factors and exchange rate behaviour of USA and United Kingdom (UK). This study revamps the model in that study by incorporating two additional non-parity factors, which are Liquidity (Junior, 2013) and Crude Palm Oil Price (Aprina, 2014), into the empirical model.

This study expands the previous researchers' work (Lee & Law, 2013; Wong, 2012; Chua & Bauer, 2011; Wong, 2009; Ho & Ariff, 2008a) who had included the non-parity determinants impact to the MYR exchange behaviour in addition of the parity determinants. Different from past studies, this study emphasizes on the non-parity factors impact to the MYR exchange behaviour against six major trading partners. Most previous literatures only focus on examining the behaviour of MYR exchange rate against USD. Although USA is one of Malaysia's trading partners, it only constitutes about 9.2% of the total trade of Malaysia. The MYR exchange rate may not behave in the same dynamics against all currencies. Thus, investigating the MYR exchange behaviour against six major trading partners will give a robust picture on the determinants of MYR exchange behaviour and how it reacts with respect to different currencies.

Findings of this study would give better understanding to the policy makers on the behaviour of MYR exchange rate over time against its major trading partners. Therefore, it would serve an empirical guide to the policy makers in designing monetary and trade policy that is beneficial to the future direction of MYR. Ensuring a stable and sustainable currency would facilitates future economic growth in Malaysia

## 3. NON-PARITY FACTORS THAT INFLUENCE EXCHANGE RATE BEHAVIOUR

### 3.1. Current Account Balance

The Absorption Approach introduced by Sydney (1952) hypothesized that a country's current account balance is determined by the difference between real income and expenditures (absorption). The variation magnitude of the current account depends on the elasticity of demands towards exchange rate variations (Daniel & Hoose, 2005). If the income is rising faster than the absorption, then the exports must be increasing relative to imports. Hence, increasing demand of domestic currency may lead to currency appreciation of the nation. Ho and Ariff (2011) contended that current account balance was a significant determinant of exchange rate behaviour of Latin American Region. As proposed by the Absorption Approach and empirical evidence, a significant relationship between current account balance and MYR exchange behaviour is expected.

### 3.2. Liquidity

Liquidity in Foreign Exchange market referred to as the degree of easiness and velocity of a currency to be sold at minimal cost and price impact (Allen & Bolton, 2004). Banti, Phylaktis and Sarno (2012) showed that there is a connection between liquidity across currencies and that liquidity risk is valued in the cross section of currency yields. Evans and Lyons (2002) argued that order flow, which reflected the buying or demand pressure of a currency can successfully explain a sizable share of the movements in the exchange rates. As demand

pressure for a currency is lower, the currency will be weaker and vice versa (Gabaix & Maggiori, 2015).

Current literature had little to say about the liquidity in foreign exchange market compared to that of in equity and bond markets and also limited empirical evidence on liquidity impact on exchange rate behaviour (Mancini, Ranaldo, & Wrampelmeyer, 2013). Mancini *et al* (2013) claimed that their research provided the first systematic study of liquidity in the foreign exchange market and found that strong co-movements across liquidity of different currencies using major currencies data from 2007 until 2009. Junior (2013) find that common factors extracted from several liquidity indicators including the monetary liquidity were useful in predicting exchange rate movements, in a study of 27 countries which consists of advanced and emerging countries. Due to limited research, therefore the impacts of liquidity on exchange rate behaviour deserve to be investigated further.

### **3.3. Trade Openness**

The Elasticity Approach (Robinson, 1937) considered the responsiveness of the quantity of imports and the quantity of exports to a change in the value of a nation's currency. Globalisation has resulted in domestic financial markets being slowly more integrated with international financial markets (Ariff 1996). The changing of trade openness can influence the currency movement (Lee & Law, 2013). Empirical evidences (Lee & Law, 2013; Wong, 2009; Ho & Ariff, 2008a; Ariff & Zarei, 2015) found that there was a significant relationship between trade openness and exchange rate behaviour. Since current empirical evidences are consistent and support the Elasticity Approach, a significant relationship between trade openness and MYR exchange behaviour is expected.

### **3.4. Fiscal Balance**

A high budget deficit may distort the economic growth of a country. Continuous rises in budget deficits will also leads to a problem of bankruptcy and eventually reduce investors' confidence (Rahman, 2012). While there is general agreement that cutting budget deficits and debt will lower interest rates, debate persists over the effects on a country's exchange rate (Hakkio, 1996). Fiscal Balance was among the non-parity variables that has limited study. Mariano, Sablan, Sardon and Paguta (2016), Kia (2013) and Ho and Ariff (2008a, 2014) found significant evidence that fiscal balance is an important determinant of exchange rate behaviour. However, the evidence was not supported for Australia (Ho & Ariff, 2008b), and G-10 (Ho & Ariff, 2011).

### **3.5. Sovereign Debt**

With continuous increase in public expenditures, and low capital formation in many developing countries, many governments have resorted into borrowing either or both within and outside the country. Serving these borrowings involve demand for foreign currency which tends to affect the exchange rate of the country (Saheed, Sani & Idakwoji, 2015). Gabaix and Maggiori (2015) contend that a currency will be weaker when the external liabilities are higher. Empirical evidences (Ho & Ariff, 2008a, 2014; Alam & Taib, 2013, Saheed *et al*, 2015) found that there was a significant impact of sovereign debt to exchange rate behaviour. The similar relationship also was found for Canada (Kia, 2013), Latin American Region (Ho & Ariff, 2014), Indonesia (Gaol, Kuncoro & Sebayang, 2015), Malaysia and ASEAN emerging countries (Ho & Ariff 2008a). Nevertheless, that impact on exchange rate is not present in Australia and other Asia Pacific countries (Ho & Ariff, 2008b). The inconsistency of finding leads the impact of sovereign debt on exchange rate to be debatable.

### **3.6. International Reserves**

To back up the currency, international reserves is asserted to bring impact to the exchange rate behaviour. As international reserves are necessary if countries are to withstand the adverse pressure of speculative capital flights and arbitrage transactions; which includes currency exchange (Clement, 1963). The amount of international reserves held by the central authority is another factor affecting exchange rate determination as reserves is a means of defending a country's currency and of providing credibility to a currency (Ho & Ariff, 2014). Effect of international reserves on exchange rate is empirical confirmed in: Malaysia and ASEAN emerging countries (Ho & Ariff, 2008a); G-10 countries (Ho & Ariff, 2011); Pakistan and US (Saeed, Awan, Sial & Sher, 2012); Canada, Japan, UK, USA and Latin American Region (Ariff & Zarei, 2015); Ho & Ariff, 2014). However, such effect is not evidenced in Australia and other Asia Pacific countries (Ho & Ariff, 2008b).

### **3.7. Crude Oil Price**

According to Malaysia Ministry of International Trade and Industry, crude oil exports account for 22.27% of Malaysia's total exports. The real oil price was said to be important in the real exchange rate determination (Lizardo and Mollick, 2010). The currency of oil exporting countries rises in value with higher oil prices while the currency of oil importing countries decrease in value, is found from data observation (Sujit & Kumar, 2011; Mariano et al, 2016). Correspondingly, Uddin, Tiwari, Arouri and Teulon (2013) argued that the strength of co-movement between return on Japanese Yen and oil price growth, differ and deviates over the time horizon. Since Japan is the third major oil-importing country, the fluctuation of oil price shock can harm industrial output that will influence inflation output through the exchange rate depreciation. The impact of real oil price on MYR real exchange rate in long-run and short-run is evidenced using data from 1971 until 2008 (Wong, 2012). Mariano, Sablan, Sardon and Paguta (2016) found significant negative effect of oil price on exchange rate in Philippine. Kiatmanaroch and Scriboonschitta (2014) employed data of USA and ASEAN countries and found that the exchange rates and crude oil prices have a long-run persistence in volatility. However, Reborredo and Castro (2013) debated that although oil price changes has no effect on USD exchange behaviour during pre-crisis period, there was evidence that showed oil prices led exchange rates from the onset of global financial crisis. Thus far, at the best of researcher knowledge, literatures on the impact of crude oil price is still fresh and limited.

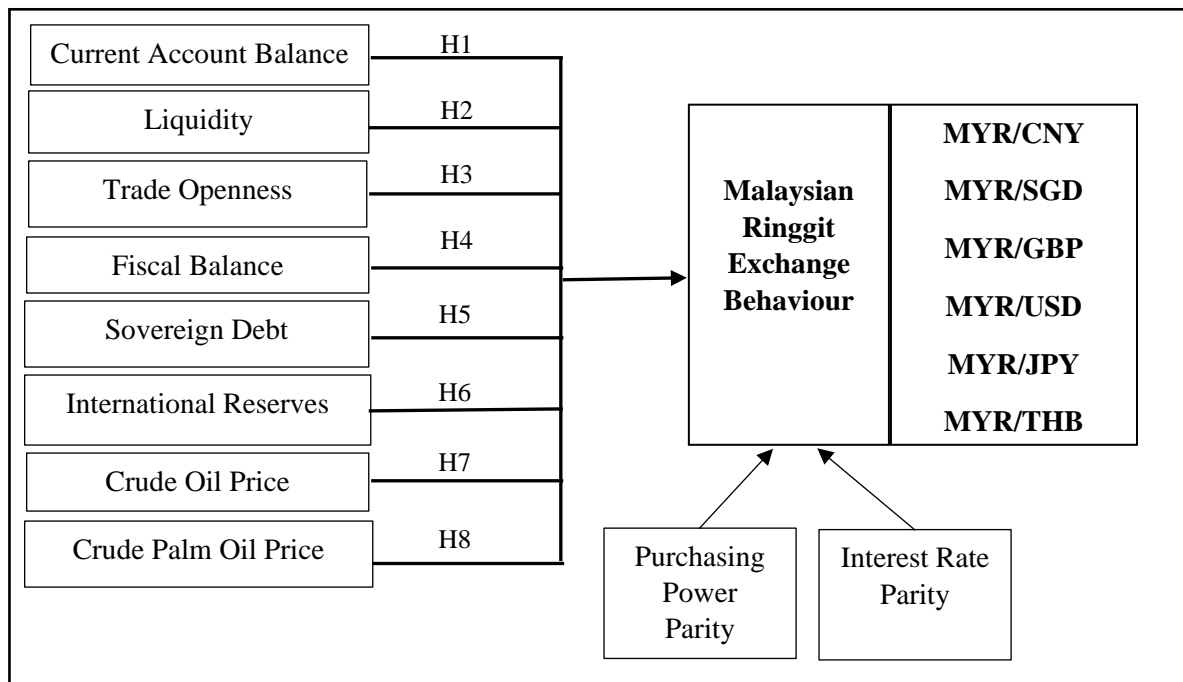
### **3.8. Crude Palm Oil Price**

Malaysia is the second largest exporters of Crude Palm Oil in the world with 39% of world palm oil production and 44% of world exports (Malaysia Palm Oil Council). Literature asserted that change in price of leading export commodities usually affects the behaviour of exchange rate either directly or through monetary transmission (Edwards, 1986; Aprina, 2014). Kiatmanaroch and Scriboonschitta (2014) use data for USA and ASEAN countries for the period of 2007 until 2013 and those researches found that a depreciating exchange rate is associated with an increase in palm oil prices. Aprina (2014) also found that the higher CPO's price leads to appreciation of Rupiah's exchange rate. She argued that the higher the growth of CPO price, the higher the domestic inflation, which will also appreciate the Rupiah's rate. More evidence of CPO price effects on exchange rate behaviour should be required, particularly in Malaysia context.

#### 4. CONCEPTUAL FRAMEWORK

Based on the existing literature (Ariff & Zarei, 2016; Ho & Ariff, 2014; Lee & Law, 2013; Wong, 2012), conceptual framework for this study are developed as Figure 3. Two new extension variables are introduced; Liquidity (Junior, 2013) and Crude Palm Oil Price (Aprina, 2014).

**Figure 2:** Research Framework



#### 5. METHODOLOGY

##### Sampling and Data Collection

The top 6 countries which has strong trade relation with Malaysia are selected based on percentage share of total trade provided by the Malaysia's Department of Statistic, the highest is China followed by Singapore, European Union, USA, Japan, and Thailand. All data for the variables are collected from Thompson Reuters DataStream database. The obtained data were then verified with the International Financial Statistics (IFS) database of the International Monetary Fund (IMF), Central Bank of Malaysia and Malaysia Palm Oil Board to ensure the reliability of the data. Quarterly data spanning from 2006 to 2016, which covers 11 years and has a total of 44 observations in this study.

##### Panel Regression

Panel regression model is employed to accounts for the heterogeneity which indicates differential estimation parameters of exchange rate across countries and time. Six models were developed for the panel regressions to explore the statistical relationship between six currency pairs as dependent variables and eight non-parity factors as independent variables. The baseline equation for the panel regression is as follows:

$$NER_{i,t} = b_0 + b_1CAB_t + b_2Ly_t + b_3TrOp_{i,t} + b_4FB_t + b_5SD_t + b_6IR_t + b_7COP_t + b_8CPOP_t + b_9PPP_{i,t} + b_{10}IRP_{i,t}$$

## Measure and Proxies

**Table 1: Measure and proxies**

| Variables                     | Measures   |
|-------------------------------|--|
| Exchange Rate (NER)           | Log difference of MYR Rate against 6 trading partners over time periods                    |
| Current Account Balance (CAB) | Current Account Balance / GDP  |
| Liquidity (Ly)                | Log of difference of Money Supply, M2  |
| Trade Openness (TrOp)         | Total Exports and Imports / GDP  |
| Fiscal Balances (FB)          | Budget Deficit or Surplus / GDP  |
| Sovereign Debt (SD)           | Foreign Debt / GDP   |
| International Reserves (IR)   | Total Reserves / Total Import  |
| Crude Oil Price (COP)         | Log of differences of Malaysian crude oil prices over time                                 |
| Crude Palm Oil Prices (CPOP)  | Log of differences of Malaysian crude palm oil prices over time                            |
| Purchasing Power Parity (PPP) | Log difference between CPI of Malaysia and 6 trading partners over time periods            |
| Interest Rate Parity (IRP)    | (1 + Short-term Real Domestic Interest Rate) / (1 + Short-term Real Foreign Interest Rate) |

## 6. FINDINGS AND DISCUSSION

Descriptive statistic is shown in table 1. The empirical findings from the panel regressions, presented in table 2, indicate that significant positive effect of current account balance and trade openness on MYR behaviour significantly present in most major trade currency pairs. Sovereign debt and crude oil price significantly affect MYR against some major trade currency pairs, such as MYR/CNY and MYR/THB. These findings suggest that greater surplus in current account balance and trade openness leads to deeper depreciation of MYR. Such positive effect may be subject to the country internal factors, for example political instability and financial scandal, that affect MYR. The finding does not fully support the fact that crude oil affecting MYR as it could be due to reducing economic dependence to the crude oil sector. Consistent to literature, parity factors do not explain MYR in most major trade currency pairs.

**Table 1: Descriptive Statistics**

| Variables            | Minimum | Maximum | Mean     | Std. Deviation | Variance |
|----------------------|---------|---------|----------|----------------|----------|
| <b>Exchange Rate</b> |         |         |          |                |          |
| MYR/CNY              | -.0442  | .0841   | .006877  | .0314221       | .001     |
| MYR/SGD              | -.0437  | .0977   | .007641  | .0261588       | .001     |
| MYR/EURO             | -.1474  | .1642   | -.003719 | .0563382       | .003     |
| MYR/USD              | -.0585  | .1542   | .003587  | .0454349       | .002     |
| MYR/JPY              | -.1212  | .2264   | .005255  | .0653035       | .004     |
| MYR/THB              | -.0425  | .0870   | .007007  | .0295757       | .001     |

| Variables                 | Minimum | Maximum | Mean     | Std. Deviation | Variance |
|---------------------------|---------|---------|----------|----------------|----------|
| <b>Non-Parity Factors</b> |         |         |          |                |          |
| CAB                       | .0040   | .2086   | .095828  | .0616722       | .004     |
| Ly                        | -.0056  | .0655   | .022007  | .0153322       | .000     |
| TrMYCN                    | .1496   | .2180   | .186329  | .0150599       | .000     |
| TrMYSP                    | .1440   | .2569   | .189046  | .0272439       | .001     |
| TrMYEU                    | .0128   | .0303   | .018061  | .0055149       | .000     |
| TrMYUS                    | .1029   | .2995   | .154069  | .0568114       | .003     |
| TrMYJAP                   | .0858   | .2099   | .151644  | .0324673       | .001     |
| TrMYTHAI                  | .0690   | .0969   | .080478  | .0081899       | .000     |
| FB                        | -.0363  | .0779   | .007721  | .0240557       | .001     |
| SD                        | .3617   | .7614   | .569208  | .1125744       | .013     |
| IR                        | 2.1989  | 3.6479  | 2.602073 | .2938682       | .086     |
| CPOP                      | -.5603  | .2748   | .017225  | .1492842       | .022     |
| COP                       | -.6574  | .2696   | -.000156 | .1659599       | .028     |

**Table 2: Empirical Findings of Panel Regression**

| Dependent variable       | MYR/CNY      | MYR/SGD   | MYR/GBP | MYR/USD   | MYR/JPY   | MYR/THB    |
|--------------------------|--------------|-----------|---------|-----------|-----------|------------|
|                          | Coefficients |           |         |           |           |            |
| <b>CAB</b>               | 0.3947*      | 0.5539*** | 0.8571* | 0.7403*** | 0.2070    | 0.5026**   |
| <b>LY</b>                | 0.2424       | 0.1406    | 0.3555  | 0.1148    | -0.4085   | 0.4950     |
| <b>TrdOp</b>             | 1.1523***    | 1.8495*** | 16.3022 | 3.7563*** | 3.3576*** | -0.2506    |
| <b>FB</b>                | 0.0291       | 0.3527*   | 0.6722  | 0.2999    | 0.0899    | 0.0605     |
| <b>SD</b>                | 0.2047**     | 0.1151    | 0.0995  | 0.0428    | 0.1189    | 0.2455***  |
| <b>IR</b>                | 0.0088       | 0.0103    | -0.0208 | 0.0533    | 0.0465    | -0.0227    |
| <b>COP</b>               | -0.0816***   | -0.0440   | 0.0805  | -0.0766   | -0.0972   | -0.1363*** |
| <b>CPOP</b>              | 0.0076       | 0.0289    | 0.0452  | 0.0987    | -0.0951   | 0.0097     |
| <b>IRP</b>               | -0.0112      | 0.0155    | 0.1044  | 0.0859*** | 0.0007    | 0.1171     |
| <b>PPP</b>               | -0.0384      | -0.6131   | 1.4129  | -0.7893   | -0.7781   | -1.1556*   |
| <b>R<sup>2</sup></b>     | 0.4809       | 0.4988    | 0.3411  | 0.4584    | 0.4563    | 0.4643     |
| <b>Adj R<sup>2</sup></b> | 0.3188       | 0.3422    | 0.1352  | 0.2892    | 0.2864    | 0.2969     |
| <b>F-statistics</b>      | 2.9653       | 3.1844    | 1.6565  | 2.7088    | 2.6860    | 2.7739     |

\*, \*\*, \*\*\* Significance at the confidence level for 1%, 5%, 10% respectively.

## 7. FUTURE RESEARCH

Increase of current account balance and trade openness cause depreciation of MYR. This might be subject to country internal factors that requires further attention from future researchers for examination. Bock and Filho (2015) debate that without compromising the importance of global factors, the domestic factors remain essential in determining the impact of global factors to the specific. Thus, it is recommended to the future researchers to explore potential country-specific-factors and seek further insight.



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