A COMPARATIVE STUDY ON THE IMPACTS OF THE US MONETARY SHOCKS ON MACROECONOMIC FLUCTUATIONS UNDER FLEXIBLE AND FIXED EXCHANGE RATE REGIMES: MALAYSIA VERSUS HONG KONG

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DECLARATION

I hereby declare that the materials and works in this thesis are original except for quotations, excerpts, equations, summaries and references, which have been duly acknowledged.

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DEGREE : **MASTER OF FINANCE (INTERNATIONAL FINANCE)**

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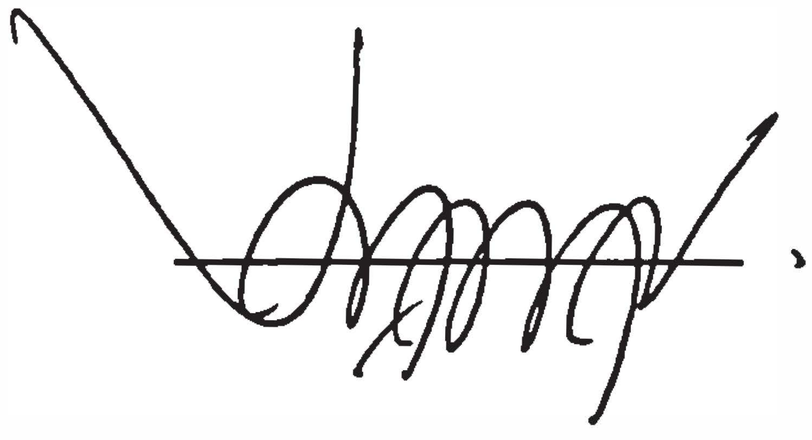

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ABSTRACT

Since the initiation of quantitative easing (QE) measures in the US in 2008, the Federal Reserve has followed up with a QE tapering in 2013 and a policy normalization measure in 2015 where the US finally raised its interest rate for the first time in nearly a decade. Such monetary operations in the US might have impacted the Malaysian market in the form of external shocks. This thesis aims to examine the effects of U.S. monetary policy expectations on macroeconomic fluctuations on Malaysia, a small and open economy. This thesis estimates a structural VAR model using monthly data from January 2000 to February 2016 with Friedman's hypothesis as a guiding principle. The result suggests that the Malaysian ringgit and industrial production were mostly affected by the U.S financial market variables. In comparison, Malaysia's inflation rate was relatively less affected by this external shock as compared to oil price shocks. This shows that the Malaysian ringgit serves as the primary absorber of the external shocks. Given that Malaysia operates under a flexible exchange rate regime, the nominal exchange rate acts as a natural automatic stabilizer when the economy faces external disturbances. Besides, based on previous studies regarding the choice of exchange rate regimes in absorbing external shocks, the results were found to be mixed. Therefore, this thesis also aims to examine the effectiveness and the role of flexible exchange rate regime against external shocks based on Friedman's hypothesis, after determining the impact of external shocks towards macroeconomic fluctuations in Malaysia. In order to show the differences between the bipolar choices of the exchange rate regime, this study will consider data from Hong Kong. With the two markets occupying either end of the spectrum, the contrast should be clearer and the conclusions more clear-cut. Consistent with prior results, the result indicates that interest rates in Hong Kong are more reactionary to U.S. monetary shocks compared to Malaysia. In general, the evidence is consistent with Friedman's hypothesis.

Keywords: U.S monetary expectations, External shocks, Macroeconomic fluctuations and Malaysia, Exchange rate regimes, Structural VAR model

ABSTRAK

KAJIAN KOMPARATIF MENGENAI KESAN KEJUTAN KEWANGAN AMERIKA SYARIKAT TERHADAP MAKROEKONOMI DI BAWAH REJIM KADAR PERTUKARAN FLEKSIBEL DAN TETAP: BANDINGAN MALAYSIA DAN HONG KONG

Sejak Amerika Syarikat melaksanakan pelonggaran kuantitatif (QE) pada 2008, melakukan QE tapering pada pertengahan 2013 dan menaikkan kadar faedah buat kali pertama dalam tempoh hampir sedekad pada Disember 2015, satu siri kejutan luaran telah dialirkan ke Malaysia. Oleh itu, kajian ini bertujuan untuk mengaji kesan jangkaan dasar kewangan Amerika Syarikat kepada turun naik makroekonomi dalam sesebuah ekonomi kecil dan terbuka seperti Malaysia. Kajian ini menganggarkan sebuah modal VAR Struktur dari tempoh Januari 2000 ke Februari 2016 dengan menggunakan hipotesis Friedman sebagai garis panduan. Keputusan kajian ini menunjukkan bahawa Ringgit Malaysia dan pengeluaran perindustrian lebih dipengaruhi oleh pasaran kewangan Amerika Syarikat. Walau bagaimanapun, inflasi Malaysia adalah kurang dipengaruhi oleh kejutan Amerika Syarikat berbanding kejutan harga minyak. Keputusan kajian ini menunjukkan Ringgit Malaysia adalah penyerap kejutan utama kepada kejutan luaran. Ini kerana Malaysia mengamalkan sistem kadar pertukaran fleksibel yang mampu membenarkan kadar pertukaran nominal bertindak sebagai penstabil ekonomi apabila ekonomi menghadapi kejutan luaran. Selain itu, kajian terdahulu yang mengaji peranan sistem kadar pertukaran bertindak sebagai penyerap kejutan luaran telah menghasilkan keputusan yang tidak dapat disimpulkan. Oleh itu, kajian ini juga bertujuan untuk mengaji keberkesanan dan peranan kadar pertukaran fleksibel terhadap kejutan luaran berdasarkan hipotesis Friedman. Untuk menunjukkan perbezaan antara pilihan bipolar sistem kadar pertukaran, kajian ini akan menggunakan data dari Hong Kong. Selaras dengan hipotesis Friedman, keputusan kajian ini menunjukkan bahawa pembolehubah makroekonomi di Hong Kong adalah lebih dipengaruhi oleh kejutan kewangan Amerika Syarikat berbanding dengan Malaysia.

Kata kunci: Jangkaan dasar kewangan Amerika Syarikat, hentakan luaran, naik-turn makroeconomi dan Malaysia, regim kadar pertukaran, modal struktur VAR

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LIST OF ABBREVIATIONS

CPI	Consumer Price Index
EXC	Exchange Rate
FAVAR	Factor-augmented Vector Autoregression
FED	Federal Reserves
GDP	Gross Domestic Product
IMF	International Monetary Fund
IPI	Industrial Production Index
IV	Instrumental Variables
MGS	Malaysian Government Security Yield
MYR	Malaysian Ringgit
NER	Nominal Exchange Rate
PPI	Producer Price Index
PVAR	Panel Vector Autoregression
QE	Quantitative Easing
SEA	South East Asia
SVAR	Structural Vector Autoregression
SVARX	Structural Vector Autoregression (Exogeneity)
US	United States
USD	United States Dollar
UST	United States Treasury Yield
VAR	Vector Autoregression

APPENDIX

CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter is divided into five sections. The first section is the background of the study followed by its problem statement, research objectives, research questions, and the thesis' outline.

1.2 Background of the Study

Studies on the impact of external shocks on emerging markets and the role of exchange rate regimes in absorbing shocks have been highlighted since the 1990s and taken seriously by various policy economist and researchers (Broda, 2001, 2004; Broda and Tille, 2003; Edwards and Yeyati, 2005; and Hoffmann, 2007). This has emerged as an important area of study especially over the past ten years, when more studies have been carried out specifically to study the international spillover effect of US monetary policy (Kim, 2001; Maćkowiak, 2007; and Allegret et al., 2012).

After years of ultra-low US interest-rate policy and three rounds of quantitative easing (QE), the U.S Federal Reserve finally raised its interest rate in December 2015 for the first time in nearly a decade, and it is expected to rise further in the near term. This recent global issue has been widely discussed, and at the same time caused a huge response and impact towards emerging countries in terms of the transmission of U.S monetary policy shocks.

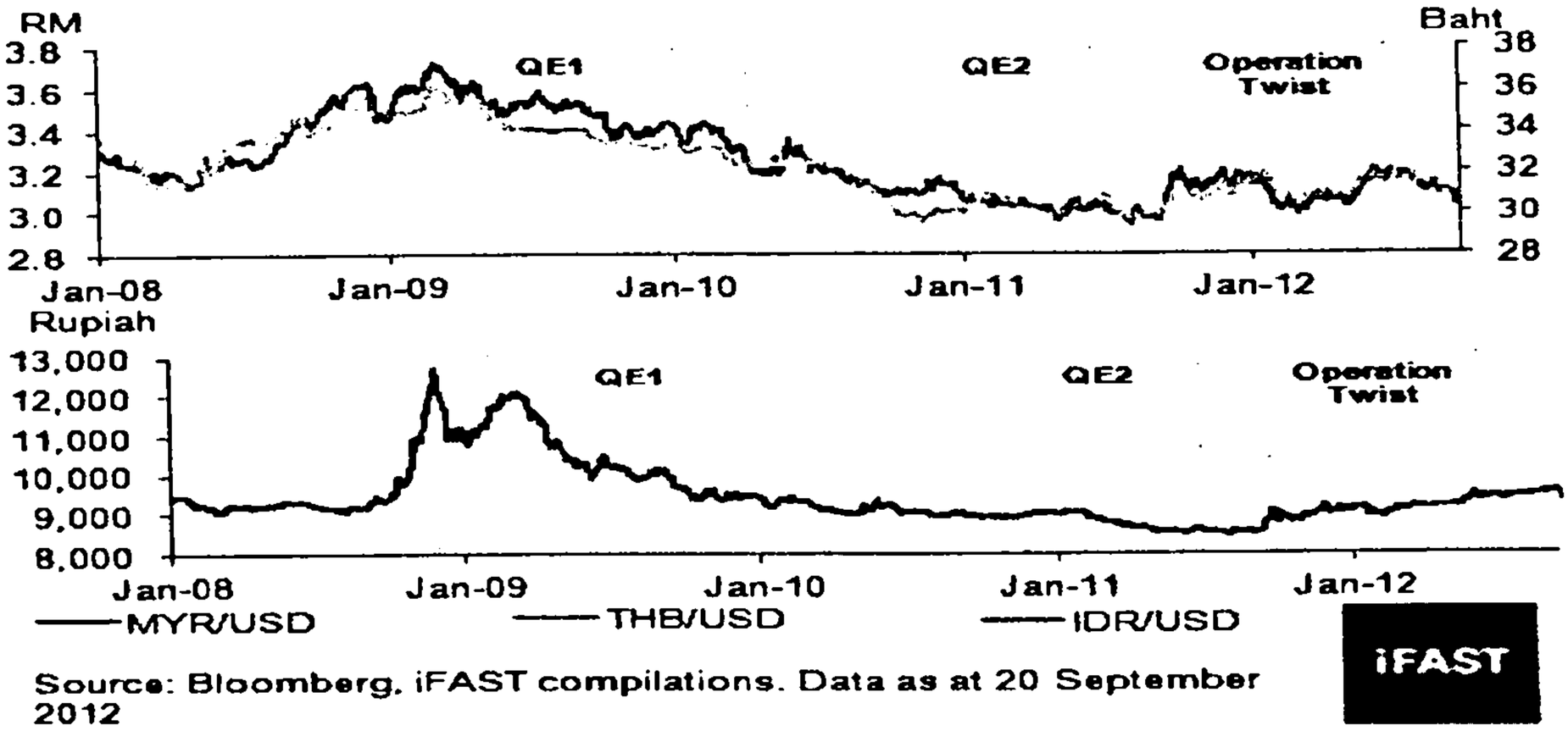
Back in 2013, talk of QE tapering shocked markets, encouraging people to look more closely at the implications of rate hikes. Sharp US dollar (USD) appreciation had a significant impact on economies, especially those with high foreign-currency

debt, large current account deficits and low net foreign assets. In this case, external shocks were transmitted towards emerging markets, particularly the financial markets.

Prior to discussion on the impact of the interest rate hike and the transmission of shocks, as well as the role of the exchange rate regime, the background of this study will be divided into three sections to show how emerging markets (particularly Malaysia) responded towards the implementation of the US monetary policy throughout the last ten years.

Implementation of Quantitative Easing (QE)

When the Fed implemented QE in 2008 in order to stimulate the economy by means of two distinct mechanisms, which include the purchase of mortgage-backed securities and long-term treasury securities, the US dollar depreciated gradually against the Malaysian Ringgit, the Indonesia Rupiah, as well as the Thai Baht as shown in **Figure 1.1** below. In other words, a weaker US dollar contrasted with stronger Malaysian Ringgit, Indonesian Rupiah, and Thai Baht.

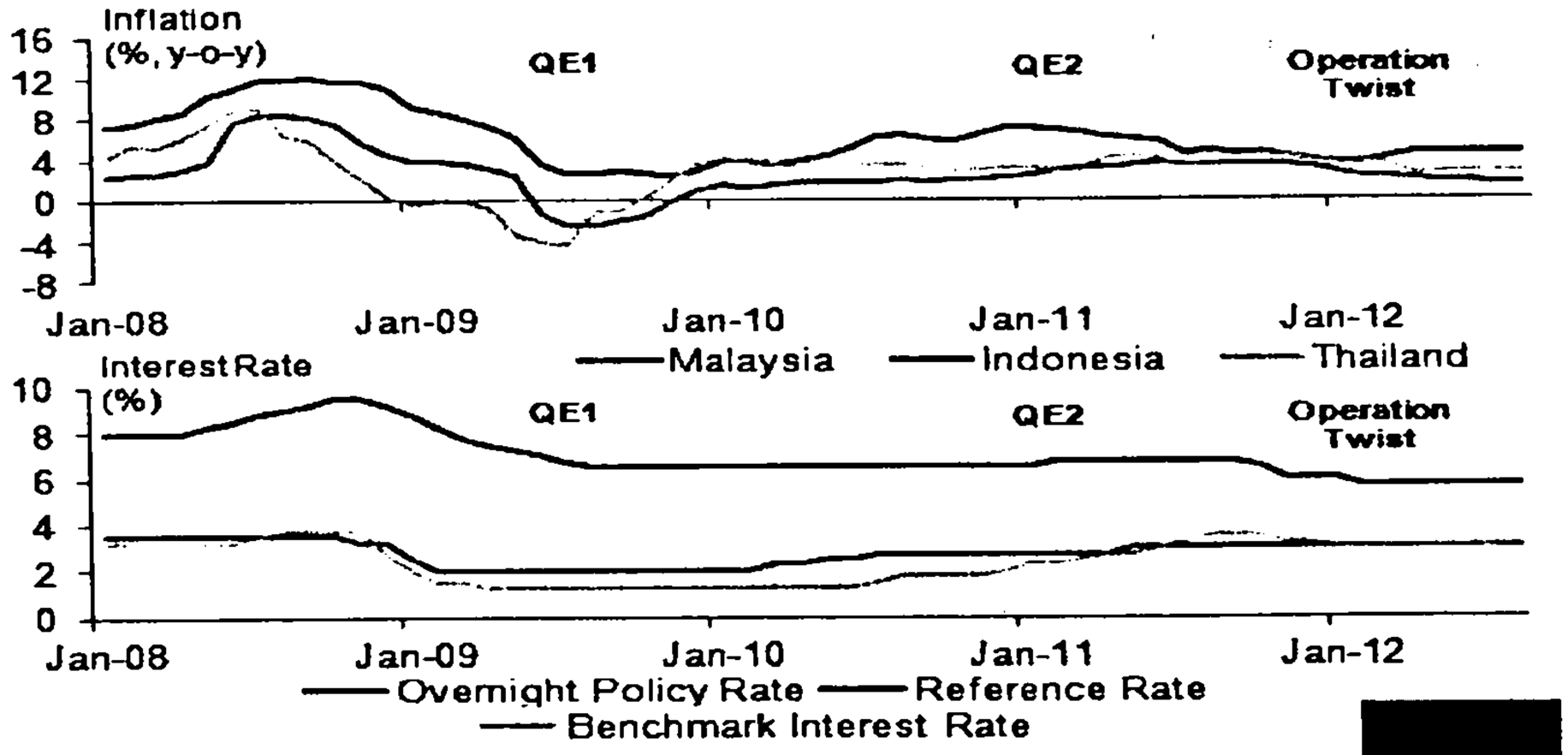


Source: Bloomberg, iFAST compilations. Data as at 20 September 2012

Figure 1.1 : The US dollar depreciated against Malaysian Ringgit, Indonesian Rupiah and Thai Baht.

Sources : fundsupermart.com.my

Inflation in both Malaysia and Thailand has been gradually controlled and retrained since the second quarter of 2012 except for Indonesia, as shown in **Figure 1.2** below. At the end of August 2012, inflation in Malaysia still remained within the central bank's 2012 target of 2.5% to 3.0%. The inflation and interest rates of Malaysia were under control during the QE period.



Source: Bloomberg, iFAST compilations. Data as at end-August 2012

Figure 1.2 : Inflation and interest rate in SEA markets.
Sources : fundsupermart.com.my

Quantitative Easing Tapering

The influence of Asia as the world's growth engine diminished when those leading emerging nations weakened and potential investors withdrew millions of USD from financial markets as expected, due to QE tapering. This led to the region's decline in growth and increase in debt. For instance, the withdrawal of investors caused Indonesian equities to plunge, driving the Indian rupee to decline to a new record low in year 2013 (CBC, 2013).

According to a news report from The Star Online (2013), the most shocking news was when the Indonesian stock market index declined by 9% in August 2013, contributing to a continuous decline of about 20% since May, wiping out all its gains in 2013. At the same time, Thailand's stock market index decreased by 6%, reaching a vulnerable level in 2013 when tapering was announced, and Malaysia's stock market index also decreased as the Malaysian Ringgit hit a three-year low. Malaysia

then reported its second quarter of sub-5% growth. Indonesian economic activities also weakened amid the worsening trade balance (in the second quarter of 2013, GDP stumbles across its lowest rate at 5.8% in three years), and Thailand entered a recession.

After the announcement of QE tapering, money flowed out of these emerging markets. The emerging markets in Asia were extremely weak and fragile. During this sudden downturn, expectations, which were unrealistically positive when QE was implemented, now became more down-to-earth and more realistic. Asia has much potential as it is still under development and emerging, however market pressure will not abate or reduce any time soon during the tapering period. Recovery takes time.

US Interest Rate Hike

The rise in US interest rates had a huge impact on the global economy, especially in emerging markets. Over the last decade when rates were low, governments and companies borrowed large sums in dollars, while investors invested in emerging economies, hoping for a better return. However, when the Fed anticipated a rise in interest rate, about one trillion USD was withdrawn from emerging markets between July 2012 and August 2015. Many emerging market currencies were then under pressure. Countries that borrowed heavily in USD were at risk. Weaker local currencies resulted in tougher payment terms for dollar debts (Prasad, 2015).

In the case of Malaysia, the interest rate hike was expected to have minimal impact on the Malaysian economy according to the news from Malaysiakini (2015), as markets were well prepared for the move. Economist mentioned that although the impact on the market was expected to be little, the news of interest rate hike earlier 2015 caused a lot of volatility globally. Further downward pressure on the ringgit may persist due to low oil and commodity prices in the short-term.

Based on the news and issues discussed above, it has been shown that external shocks were transmitted to emerging economies through several channels. From the US implementing QE to its interest rate hike, external shocks cannot be neglected. Innovations and changes in US monetary policy directly and indirectly transmitted external shocks towards emerging markets.

Therefore, it is important to examine the impact of external disturbances on emerging markets' macroeconomic performance, which in this study will focus on Malaysia. Furthermore, the present study will also examine the role of exchange rate regimes in absorbing external shocks. This includes a cross-country comparison of Malaysia and Hong Kong. To see a clearer picture on the response of domestic variables towards external shocks based on different regimes, this study examines Hong Kong, given that Hong Kong and Malaysia represent polar choices of exchange rate regimes.

To clarify, the focus of this study is mainly on external factors. Given that the period of this study coincided with the time of economic turbulence in Malaysia, it might be affected by internal factors as well. It is important to note that internal factors are not within the scope of this research. Hence, all literatures, outcomes and results are purely based on the account of external factors.

1.3 Problem Statement

Over the past two decades, the empirical literature on the impact of external shocks, in particular the US monetary policy shocks towards developed and emerging market economies, generated huge interest among researchers. A large body of literature has long documented that the US Federal Reserve's conventional monetary policy shocks is an important driver of global financial market volatility, with lower rates pushing capital to emerging markets and vice versa. In the wake of the global economic downturn of 2008, the Fed employed unconventional monetary policy (UMP) in an attempt to stem the crisis, return its economy to full employment and reduce extreme domestic financial market volatility. Given the leading role of the United States in the global economy, one is therefore curious as to whether the UMP created global macroeconomic fluctuations, particularly in Malaysia and to what extent the choice of exchange rate regime matters in utilizing the role of exchange rate as an external shock absorber.

The US' unconventional monetary policy was expected to have substantial international implications. However, there are limitations inherent in the literature. One of the limitations is that most recent research only studied the impact of the US' unconventional monetary policy on the US financial markets (Hamilton and Wu, 2012; D'Amico and King, 2013; Swanson and Williams, 2014). Although there is important work assessing the global effects of the U.S.' QE programs (Glick and Leduc, 2012; Chen et al., 2012; Bauer and Neely, 2014), there is less certainty over the response of the emerging market economies as to the effects from the US unconventional monetary policy.

Secondly, a number of studies have focused on the impact of the US' conventional monetary policy in international financial markets. Although all studies find some evidence of spillover effects, there appeared to be some contradiction in the findings with regard to the magnitude of the impact of U.S. monetary shocks on these markets (Kim, 2001; Canova, 2005; Hoffmann, 2007; Maćkowiak, 2007; Allegret et al., 2012). That being said, Raghavan et al. (2012) show that the impact of international monetary shocks varied over the period of 1980 to 2006. Their findings exhibit substantial contrast: exchange rate and monetary policy shocks significantly affect the exchange rate, interest rate, money, price and output in the pre-Asian financial crisis period. While in the post-crisis period, only money shocks tended to have a bigger impact on output. Nevertheless, these differences pertain only to pre-US unconventional monetary policy (QE programs, forward guidance, 2013 taper tantrum, great plunge in oil prices and the recent hike in US interest rate in December 2015) period and are less suited to provide a complete assessment of the importance of the US monetary and financial shocks.

Lastly, the choice of the exchange rate regime and its role as an absorber of external shocks is undoubtedly one of the most important debates in international finance literature (Broda, 2004). According to a recent research done by Maratheftis and Lombardi (2015), currencies are the main shock absorbers in emerging markets. Instead of affecting the real economy, currency moves absorb shocks and protect the economic performance, specifically on the industrial production, and insulate domestic activities. Besides that, earlier research stated that a country with flexible

exchange rate regime is more likely to handle external shocks efficiently (Meade, 1951; Friedman, 1953; Mundell, 1961; Poole, 1970). Recent studies by Broda (2004), Edwards and Levy-Yeyati (2005), Edwards (2006) and Ramcharan (2006) also found out that output in countries with flexible exchange rates adjusts much faster than in countries that adopt fixed exchange rates. However, contrary to the theory, Kaminsky, Reinhart and Végh (2004), Frankel, Schmukler and Serven (2004) and Maurel and Schnabl (2012) have shown that countries with flexible exchange rates may not be able to efficiently handle adverse shocks.

Therefore, the present study aims to bridge the gap in the literature and assesses the effects of US unconventional monetary shocks on macroeconomic fluctuations in Malaysia. More specifically, this study extends the sample period to the recent 2015 US interest rate hike and conducts a comparative study on the impact of US monetary shocks on macroeconomic fluctuations in Malaysia under flexible and fixed exchange rate regimes.

1.4 Research Questions

The research questions this study addresses, in line with the above research objectives, are as follows:

i. What are the effects of external shocks and expectations of US monetary policy on Malaysian macroeconomic fluctuations, specifically on the inflation, industrial production price index, real exchange rates, and interest rate?

ii. Is Malaysia's flexible exchange rate regime able to handle external shocks?

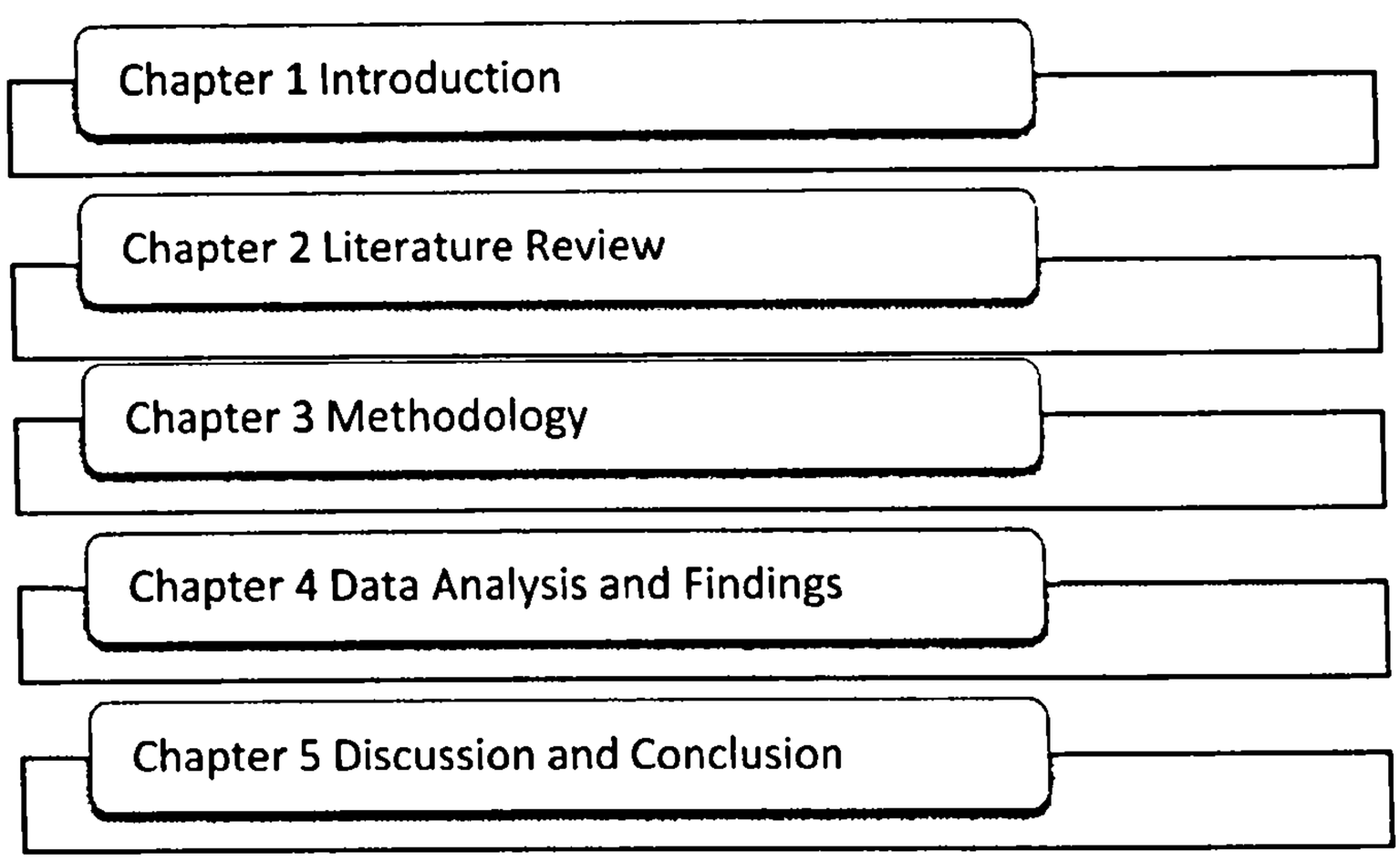
1.5 Research Objectives

The objectives of this study will be as below:

i. To examine the impact of external shocks (a rise in the 10-year US Treasury yield, an appreciation in the broad USD index, global oil price movement) towards Malaysia's macroeconomic performance, in particular, Malaysia's inflation, industrial production index, real exchange rate, and interest rate.

ii. To examine the role of Malaysia's flexible exchange rate regime in absorbing external shocks.

1.6 Thesis Structure Outline



This study is divided into five chapters. Chapter one of this study discusses the background of the study, the problem statements, research questions and objectives, and the organization of the study.

Chapter two consists of the literature review where the discussion is divided into four parts, including the sources of external shocks and their impacts, external shocks and exchange rate regimes choices, the classification of exchange rate regimes and the conclusion.

Chapter three in this study discusses the research methodology, which includes the method approach, the literature on vector autoregression model (VAR), structural vector autoregression model (SVAR), and the data description.

Chapter four presents data analysis by using the methodology approach discussed in chapter three. The software used to run the result will be EViews9. Result of data collected will be analysed. Besides, variance decomposition and impulse responses will be illustrated in this chapter.

Lastly, chapter five recaps, summarizes and discusses the findings of the study. This chapter also emphasizes the implications of the study and the discussions of findings. The final part of this study will end with recommendations for future research and a conclusion.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter reviews literature on the types of external shocks and their impacts, the role of flexible exchange rate, exchange rate regime choices, and discusses the classification of exchange rate regimes. A conclusion on review and discussion is drawn in this chapter.

2.2 Types of External Shocks and Their Impacts

One of the important causes of macroeconomic fluctuations in emerging markets is external shocks (Maćkowiak, 2007) and policymakers often attributed to external shocks such as the international conditions, natural disasters, terms of trade fluctuation, or aid volatility for a country's volatile performance (Raddatz, 2007). According to the reports by IMF (2003), exogenous shocks could have a significant and negative impact on developing countries' macroeconomic stability, the countries' growth, their debt sustainability and the poverty level. The impact of external shocks however, depends on the openness of the economy (Rattsø and Torvik, 1998). Emerging countries with a small open economy such as Malaysia's are more vulnerable and sensitive towards external shocks. Therefore, it is crucial to identify different types of external shocks and their impact on emerging economies.

2.2.1 World Interest Rate Shocks

Theoretically, the global interest rate is a substantial mechanism where foreign shocks or external shocks are transmitted to small open economies. Adjustments in the world interest rate are external shocks which can influence economic behavior

along borders. For instance, these shocks can affect household by generating or considering intertemporal substitution on wealth, investments, and portfolio allocation, which at the same time also affects domestic investment due to altering incentives by firms.

In the earlier studies, several significant researches on the impacts of world interest rates found that interest rates merely affect the progress of small open economies. In particular, the world interest rate shocks have minor effects on consumption, labour hours, outputs, and in certain cases, on net foreign assets, net exports, as well as investments (Mendoza, 1991; Correia, Neves and Rebelo, 1995; and Schmitt-Grohe, 1998). In contrast, Blankenau, Kose and Yi (2001) argued that these shocks can have a huge impact, particularly on economic output, foreign assets, and net exports.

Hoffman (2007) studied both fixed and flexible exchange rate regimes in absorbing external disturbances by focusing on two types of shocks: world output shocks and world interest rate shocks. The author stated that lately, the changes in world interest rate caused emerging market economy a huge turmoil in global financial markets. A few examples of disturbances in financial markets can be seen when i) during the beginning of the 1980s, the US increased interest rates to control inflation resulting from restrictive monetary policy; ii) decrease of the interest rate to trigger and stimulate the economy in response to the 1990-1991 downturn; iii) and the increase again from 0% to a 5% hike on the interest rate due to the strengthen of the economy during the late 2015. Therefore, it is important to re-examine the significances of world interest rate shocks towards developing and emerging economies, especially now that the transmission of interest rate shocks after the US interest rate hike is a pressing current issue and causes an impact on the global economy.

Furthermore, Neumeyer and Perri (2005) have proven that there is an existing robust connection between business cycle and interest rate in emerging markets. Therefore, the world interest rate shocks acquire significant impact on the real exchange rates and hence, on net exports and consumptions. Hoffman (2007) also

mentioned that in order to analyze the empirical results of the world interest rate on small open economies, particularly on trade balance, outputs and real exchange rates, the interaction between the world interest rate and world output must be examined. The progressions in world output will affect the world interest rate. In other words, the two are not independent.

As world interest rate shocks affect real exchange rate, output and trade balance as mentioned on the literature above, the early idea that external shocks are vital in emerging markets (in terms of capital flows) goes back to the empirical research by Calvo et al. (1993). By carrying out the study on capital inflows into Latin American countries, the authors noted that the circumstances in foreign regions, for instance, the recession in the US and lower global interest rates explained the capital inflow. Besides, several empirical studies also indicated that external impacts are important on capital inflows. The markdown in the foreign interest rate caused a large portion of capital inflows into Latin American countries (Calvo et al., 1996; Chuhan et al., 1993; and Fernandez-Arias, 1996).

Calvo et al. (1993) argued that the ongoing recession, the decrease in interest rate, and the US balance of payment developments encourage and motivate investors to reallocate their wealth and resources to Latin American countries. This leverage allows investors to venture into new investment opportunities and increase their financial competency, hence resulting in a worldwide capital inflow in Latin American economies. In addition, Latin American countries are not the only ones experiencing massive increasing capital inflows. Middle East and Asian countries also experience vast capital outflows from the US and Japan. According to basice economic principles, generally capital inflows suggest an appreciation in the real exchange rate, rapid economic growth, booming stocks and real estate markets, an increase of international reserve funds, and the solid resumption of secondary-market prices for foreign loans and credits.

The study of capital flows has been a popular subject between the period of late 1980s and 2000s due to large capital inflows towards developing and emerging economies. According to Vita and Kyaw (2008), literatures on the principles of capital

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Appendix A
IMF's New Exchange Rate Regime Classification (2014)

Exchange Rate Regime	Definition
Exchange arrangement with no separate legal tender	An exchange rate arrangement with no separate legal tender involves confirmation of the authorities' de jure exchange rate arrangement. The currency of another country circulates as the sole legal tender (formal dollarization). Adopting such an arrangement implies complete surrender of the monetary authorities' control over domestic monetary policy.
Currency board arrangements	A currency board involves the confirmation of the country authorities' de jure exchange rate arrangement. A currency board arrangement is a monetary arrangement based on an explicit legislative commitment to exchange domestic currency for a specified foreign currency at a fixed exchange rate, combined with restrictions on issuance authority to ensure the fulfilment of its legal obligation.
Conventional peg	A conventional peg involves confirmation of the country authorities' de jure exchange rate arrangement. In this category, the country formally (de jure) pegs its currency at a fixed rate to another currency or a basket of currencies, where the basket is formed, for example, from the currencies of major trading or financial partners and weights reflect the geographic distribution of trade, services, or capital flows. The anchor currency or basket weights are public or notified to the IMF.
Stabilized arrangement	Classification as a stabilized arrangement entails a spot market exchange rate that remains within a margin of 2% for six months or more (with the exception of a specified number of outliers or step adjustments) and is not floating. The required margin of stability can be met either with respect to a single currency or a basket of currencies, where the anchor currency or the basket is ascertained or confirmed using statistical techniques. Classification as a stabilized arrangement requires that the statistical criteria be met and that the exchange rate remain stable as a result of official action (including structural market rigidities).

Crawling peg	A crawling peg involves confirmation of the country authorities' de jure exchange rate arrangement. The currency is adjusted in small amounts at a fixed rate or in response to changes in selected quantitative indicators, such as past inflation differentials vis-à-vis major trading partners or differentials between the inflation target and expected inflation in major trading partners. The rate of crawl can be set to generate inflation-adjusted changes in the exchange rate (backward looking) or be set at a predetermined fixed rate and/or below the projected inflation differentials (forward looking).
Crawl-like arrangement	In a crawl-like arrangement, the exchange rate must remain within a narrow margin of 2% relative to a statistically identified trend for six months or more (with the exception of a specified number of outliers), and the exchange rate arrangement cannot be considered to be floating. Usually, a minimum rate of change greater than allowed under a stabilized (peg-like) arrangement is required; however, an arrangement is considered crawl-like with an annualized rate of change of at least 1%, provided the exchange rate appreciates or depreciates in a sufficiently monotonic and continuous manner.
Pegged exchange rate within horizontal bands	Classification as a pegged exchange rate within horizontal bands involves confirmation of the country authorities' de jure exchange rate arrangement. The value of the currency is maintained within certain margins of fluctuation of at least ±1% around a fixed central rate, or a margin between the maximum and minimum value of the exchange rate that exceeds 2%.
Other managed arrangement	This category is a residual and is used when the exchange rate arrangement does not meet the criteria for any of the other categories. Arrangements characterized by frequent shifts in policies may fall into this category.
Floating	A floating exchange rate is largely market determined, without an ascertainable or predictable path for the rate. In particular, an exchange rate that satisfies the statistical criteria for a stabilized or a crawl-like arrangement is classified as such unless it is clear that the stability of the exchange rate is not the result of official actions. Foreign exchange market intervention may be either direct or indirect and serves to moderate the rate of change and prevent undue fluctuations in

	the exchange rate, but policies targeting a specific level of the exchange rate are incompatible with floating. Indicators for managing the rate are broadly judgmental (e.g., balance of payments position, international reserves, parallel market developments). Floating arrangements may exhibit more or less exchange rate volatility, depending on the size of the shocks affecting the economy.
Free floating	A floating exchange rate can be classified as free floating if intervention occurs only exceptionally and aims to address disorderly market conditions and if the authorities have provided information or data confirming that intervention has been limited to at most three instances in the previous six months, each lasting no more than three business days. If the information or data required are not available to the IMF staff, the arrangement is classified as floating.

Sources: IMF Annual Report on Exchange Arrangements and Exchange Restrictions 2014.