THE LONG RUN RELATIONSHIP BETWEEN EXCHANGE RATE AND ITS DETERMINANTS IN SELECTED ASEAN COUNTRIES



SCHOOL OF INTERNATIONAL BUSINESS AND FINANCE UNIVERSITI MALAYSIA SABAH 2010

THE LONG RUN RELATIONSHIP BETWEEN EXCHANGE RATE AND ITS DETERMINANTS IN SELECTED ASEAN COUNTRIES

NOOR ZAINAB BINTI TUNGGAL

THESIS SUBMITTED IN FULFILLMENT FOR THE DEGREE OF MASTER OF FINANCE (INTERNATIONAL FINANCE)



UNIVERSITI MALAYSIA SABAH



NOTE: [@] Thesis meant is Doctor of Philosophy thesis, Master by research thesis or dissertation for Masters by Course Work and Research or First Degree Project Report.

DECLARATION

I hereby declare that the material in this thesis is my own except for quotations, excerpts, equations, summaries and references, which have been duly acknowledged.

24 May 2010

Noor Zainab Binti Tunggal PL2006/8326



CERTIFICATION

- NAME : NOOR ZAINAB BINTI TUNGGAL
- MATRIC NO : **PL2006/8326**
- TITLE: THE LONG RUN RELATIONSHIP BETWEEN EXCHANGE RATEAND ITS DETERMINANTS IN SELECTED ASEAN COUNTRIES
- DEGREE : MASTER OF FINANCE (INTERNATIONAL FINANCE)

VIVA DATE : 17 NOVEMBER 2009



ACKNOWLEDGEMENT

First and foremost, I am grateful to ALLAH SWT on blessing in completing this research. Mere words fail to express my immense thanks to my supervisors Prof. Dr. Syed Azizi Wafa and Assoc. Prof. Dr. Liew Khim Sen for their guidance and help in completing this research. For people and organization whom offered an endless generosity and kindness. For my parents and family for their encouragement and patience, a very special thanks for them. Special Thanks to my friends and those who also supports my research.

Regards, Noor Zainab. Tunggal 24 May 2010 INIVERSITI MALAYSIA SABAH

ABSTRACT

THE LONG-RUN RELATIONSHIP BETWEEN EXCHANGE RATE AND ITS DETERMINANTS IN SELECTED ASEAN COUNTRIES

This study examines the long-run relationship between exchange rate and its determinants for Indonesia, the Philippines, Singapore, Malaysia and Thailand vis-àvis the United States and Japan by applying standard monetary model augmented with stock price and current account. The samples period covers from quarter one of 1991 for Indonesia, Thailand and Malaysia, 1985 for Singapore and 1981 for the Philippines to quarter three of 2007. The integration order tests and ARDL model for cointegration were implemented in this study to verify the order of integration for the series and to determine the cointegration relationship among variables. This study has showed that all variables are integrated in mixed order, I(0) or I(1) for Indonesia, the Philippines, Singapore, Malaysia and Thailand against the United States and Japan. Moreover, the majority of countries, namely, Indonesia, the Philippines and Singapore have exhibit long-run relationship between exchange rate and its determinants. Meanwhile, this study confirmed that there was no long-run relationship among variables for the case of Thailand regardless of whether the United States or Japan was used as base currencies. Furthermore, there was no long-run relation between exchange rate and its fundamentals for Malaysia against the United States and inconclusive result for Malaysia vis-à-vis Japan. In this study, there were some variables are important to exchange rate for each country. Thus, all the results were in mixed evidence for all the countries. Finally, the empirical findings showed that stock price and current account are important determinants to be included in cointegration test. In other words, models of exchange rate should be extended to include stock price and current account in estimating long-run relationship among variables.

Keywords: Exchange rates; Equity markets; Current account balance; Augmented monetary model; ARDL model for cointegration.

ABSTRAK

Kajian ini adalah untuk menyelidik hubungan jangka panjang di antara kadar pertukaran dan penentu-penentunya di Indonesia, Filipina, Malaysia, Singapura dan Thailand bertentangan dengan Amerika Syarikat dan Japun melalui penggunaan model kewangan dengan menambahkan harga saham dan akaun semasa. Sampel data adalah merangkumi dari suku pertama tahun 1991 untuk Indonesia, Thailand dan Malaysia, 1985 untuk Singapura dan 1981 untuk Filipina hingga suku ketiga tahun 2007. Ujian-ujian susunan integrasi dan model ARDL untuk hubungan jangka panjang dilaksanakan bagi mengenal pasti susunan integrasi untuk pembolehubahpembolehubah dan untuk menentukan hubungan pembolehubah-pembolehubah dalam jangka panjang bagi kajian ini. Kajian ini telah menunjukkan bahawa semua pembolehubah mempunyai campuran susunan integrasi, I(0) atau I(1) bagi Indonesia, Filipina, Singapura, Malaysia dan Thailand bertentangan dengan Amerika Syarikat dan Japun. Tambahan pula, majoriti negara seperti Indonesia, Filipina dan Singapura menunjukkan wujudnya hubungan jangka panjang di antara kadar pertukaran dan penentu-penentunya. Sementara itu, kajian ini juga menunjukkan bahawa tidak terdapat hubungan di kalangan pembolehubahpembolehubah pada jangka panjang bagi Thailand tidak kira sama ada Amerika Syarikat atau Japun digunakan sebagai asas mata wang. Selain itu, tiada hubungan jangka panjang di antara kadar pertukaran dan penentu-penentunya untuk Malaysia bertentangan dengan Amerika Syarikat dan keputusan tidak pasti untuk Malaysia bertentangan dengan Japun. Dalam kajian ini, beberapa pembolehubahpembolehubah adalah penting kepada kadar pertukaran untuk setiap negara. Oleh itu, didapati semua keputusan mempunyai bukti yang bercampur. Akhirnya, penemuan empirikal menunjukkan bahawa harga saham dan akaun semasa adalah penentu-penentu penting dalam memasukkan pembolehubah ini dalam ujian coingtegrasi. Dengan kata lain, model-model bagi kadar pertukaran perlu diambil kira dengan memasukkan harga saham dan akaun semasa.

TABLE OF CONTENTS

Pa	g	e
Pa	g	e

TITLE	i		
DECLARATION			
CERTIFICATION	iii		
ACKNOWLEDGEMENT	iv		
ABSTRACT	v		
ABSTRAK	vi		
LIST OF CONTENTS			
LIST OF TABLES			
LIST OF FIGURES			
CHAPTER 1: INTRODUCTION	1		
1.1 Motivation of Study	5		
1.2 Statement of Problems	7		
1.3 Research Questions	9		
1.4 Objectives of Study	9		
1.5 Significance of Study	11		
1.6 Organization of Study	12		
CHAPTER 2: FRAMEWORK AND LITERATURE REVIEW			
2.1 Concept of Theory	14		
2.2 Theoretical Framework	16		
2.2.1 Flexible-Price Monetary Model	16		
2.2.2 Sticky Price Monetary Model	20		

	2.2.3 Monetary Model augmented with stock price and current account	24
2.3	Testing Procedures	26
2.4	Empirical Evidence Findings	29
2.5	Concluding Remarks	37

CHAPTER 3: DATA AND METHODOLOGY

3.1	Exchange rate Model	39
3.2	Data	40
3.3	Methodology	41
	3.3.1 Integration Order Test	42
	3.3.2 Cointegration Test	46
ALX.	3.3.3 Exclusion Test	49
3.4	Concluding Remarks	49
	UNIVERSITI MALAYSIA SABAH	
CHA	PTER 4: EMPIRICAL RESULTS	

4.1	Integration Order Test Results	50
	4.1.1 ASEAN Countries against the United States	50
	4.1.2 ASEAN Countries against Japan	55
4.2	Cointegration Test Results	58
	4.2.1 Indonesia vis-à-vis the United States	58
	4.2.2 The Philippines vis-à-vis the United States	63
	4.2.3 Singapore vis-à-vis the United States	66
	4.2.4 Thailand vis-à-vis the United States	69

	4.2.5 Malaysia vis-à-vis the United States	72
	4.2.6 Indonesia vis-à-vis Japan	75
	4.2.7 The Philippines vis-à-vis Japan	78
	4.2.8 Singapore vis-à-vis Japan	81
	4.2.9 Thailand vis-à-vis Japan	84
	4.2.10 Malaysia vis-à-vis Japan	87
4.3 CHA	Exclusion Test Results APTER 5: DISCUSSION AND CONCLUSION	90
5.1	Summary and Discussion	94
5.2	Policy Implications	98
5.3	Limitation of Study	100
5.4	Recommendation For Future Research	101
5.5	Conclusion	102
	UNIVERSITI MALAYSIA SABAH	

LIST OF TABLES

Table 3.1	Sample Period	41
Table 3.2	Definition of Data	41
Table 4.1	Result of Integration Order Test (the United States)	54
Table 4.2	Result of Integration Order Test (Japan)	57
Table 4.3	ARDL bound testing for cointegration analysis for Indonesia against the United States	62
Table 4.4	Estimated Long-run Coefficients for Indonesia	63
Table 4.5	ARDL bound testing for cointegration analysis for the Philippines against the United States	65
Table 4.6	Estimated Long-run Coefficients for the Philippines	66
Table 4.7	ARDL bound testing for cointegration analysis for Singapore against the United States	68
Table 4.8	Estimated Long-run Coefficients for Singapore	69
Table 4.9	ARDL bound testing for cointegration analysis for Thailand against the United States	71
Table 4.10	Estimated Long-run Coefficients for Thailand SIA SABAH	72
Table 4.11	ARDL bound testing for cointegration analysis for Malaysia against the United States	74
Table 4.12	Estimated Long-run Coefficients for Malaysia	75
Table 4.13	ARDL bound testing for cointegration analysis for Indonesia vis-à-vis Japan	77
Table 4.14	Estimated Long-run Coefficients for Indonesia	78
Table 4.15	ARDL bound testing for cointegration analysis for the Philippines vis-à-vis Japan	80
Table 4.16	Estimated Long-run Coefficients for the Philippines	81
Table 4.17	ARDL bound testing for cointegration analysis for Singapore vis-à-vis Japan	83

Table 4.18	Estimated Long-run Coefficients for Singapore	84
Table 4.19	ARDL bound testing for cointegration analysis for Thailand vis-à-vis Japan	86
Table 4.20	Estimated Long-run Coefficients for Thailand	87
Table 4.21	ARDL bound testing for cointegration analysis for Malaysia vis-à-vis Japan	89
Table 4.22	Estimated Long-run Coefficients for Malaysia	90
Table 4.23	Test of Exclusion	92



LIST OF FIGURES

Figure 4.1	Stability Test	for Indonesia against the United States	62
Figure 4.2	Stability Test	for the Philippines against the United States	66
Figure 4.3	Stability Test	for Singapore against the United States	69
Figure 4.4	Stability Test	for Thailand against the United States	72
Figure 4.5	Stability Test	for Malaysia vis-à-vis the United States	75
Figure 4.6	Stability Test	for Indonesia vis-à-vis Japan	78
Figure 4.7	Stability Test	for the Philippines vis-à-vis Japan	81
Figure 4.8	Stability Test	for Singapore vis-à-vis Japan	84
Figure 4.9	Stability Test	for Thailand vis-à-vis Japan	87
Figure 4.10	Stability Test	for Malaysia vis-à-vis Japan	90





CHAPTER 1

INTRODUCTION

Exchange rate plays an important role in international trade and international finance. The exchange rate can be considered as a crucial channel that links the macroeconomic of an open domestic country to its trading partners. The domestic and foreign price of goods will adjust to one another via the exchange rate link, for instance. Moreover, exchange rate is also one of the important factors that determine whether foreign direct investment (FDI) would go onto domestic or foreign countries. It depends on the value of exchange rate. For instance, even though the interest rate may be higher for foreign countries, but once converted into the lower value of domestic currency, the investors will better off investing in local country rather than in foreign country. This is because their profits will reduced when converted into home currency.

Movements of exchange rate also have important impacts to exporters and importers. By definition, export is a foreigner's purchases of domestic goods and services whereas import is a foreigner's selling of their goods or services to domestic country. An appreciation in exchange rate will make domestic goods more expensive relative to foreign goods. Hence, this will lower the export of domestic goods. In contrast, depreciation in exchange rate will increase exports of domestic goods. On the other hand, when the exchange rate appreciates, foreign goods will be relatively cheaper from the domestic point of view. Thus, imports of domestic countries will rise. In contrast, imports will decrease if exchange rate depreciates (Yarbrough and Yarbrough, 2003).

Besides, operations of multinational corporations (MNC) are also involved in payables and receivables denominated in different currencies. Financial management in multinational corporations faces exchange rate risk in financial control, cash management, intrafirm transfers and capital budgeting. Financial management is involved in exchange rate through foreign subsidiary. Foreign managers will look into gains or losses in terms of converted currency to measure foreign subsidiary. The other impact of exchange rate in MNC is cash management, which is related to liquid assets. Financial management needs to make decision whether to invest in domestic currency or foreign currency. It means that, if foreign currency will give more profit to subsidiaries, they will convert into foreign currency or otherwise they will invest in domestic currency¹. For these reasons, clearly exchange rate is crucial to open economy especially the Asian countries that have experienced the financial crisis in 1997.

Because of the importance of exchange rate, studying of the behaviour of exchange rate and the factors that determine the movement of exchange rate is popular among researchers, practitioners and policymakers. Theoretically, the exchange rate behaviour is determined by monetary fundamentals such as money supply, income and interest rate. For example, an increase in domestic money supply will induce depreciation of domestic currency. Instead, exchange rate will appreciate if foreign money supply increases. For the higher domestic real income, domestic currency will appreciate due to more demand for domestic money. In contrast, an increase in foreign real income will induce the lower demand for domestic money, thereby causing domestic currency to depreciate. Finally, higher domestic interest rate will induce domestic currency appreciation. In contrast, domestic currency will depreciate when domestic interest rates fall. Previously, many researchers have investigated the relationship between exchange rate and these macro variables (see for instance, Frenkel, 1976; Dornbusch, 1976; Bilson, 1978; Frankel, 1978; Moosa, 1994; MacDonald and Taylor, 1993, 1994 and Rapach and Wohar, 2002, 2004). Most of these studies examine the United States Dollar and Japanese Yen based exchange rate. Thus, this study attempts to examine the relationship between exchange rate and monetary fundamentals which are focusing on ASEAN countries, namely Indonesia, the Philippines, Singapore, Malaysia and Thailand against not only Japan but also the United States.

Since the 1980s, Japan and the United States are the major trading partners of Asian countries until present. Besides, Japan and the United States are also the top five trading partners to ASEAN countries in the recent years. In fact, in the

¹ See Melvin (2000) for more explanation of Multinational Corporation that involves exchange rate.

1980s and the 1990s, Japan and the United States were always ranked the top three trading partners of Singapore. In 1980, Singapore's exports to the United States and Japan were US\$2424.06 million and US\$1559.94 million respectively, which were the second and the third largest after Malaysia. Meanwhile, Singapore's imports from Japan and the United States were the first and second largest which was reaching up to US\$4310.95 million and US\$3388.53 million. At the end of the 1990s, Singapore's exports to the United States and Japan had risen to US\$22055 million and US\$8512.67 million. On the other hand, Singapore's imports from the United States and Japan have amounted to US\$19022.30 million and US\$18505.20 million in 1999. Starting from 2003 until 2006, Japan was the sixth largest and the United States remains in the top five trading partners of Singapore. Singapore's exports to Japan and the United States have risen from US\$9696.04 million and US\$20570 million in 2003 to US\$14854.70 million and US\$27622.10 million in 2006, respectively (International Monetary Fund, 2008).

Meanwhile, Japan had been Indonesia's first largest trading partner from 1980 to 2005. For instance, at the end of the 1980s, trade between Indonesia and Japan was about US\$13084.68 million (exports at US\$9252.35 and imports at US\$3832.33), and then their trade rose to US\$13310.49 million (exports at US\$10397.20 and imports at US\$22014.60 and imports at US\$8107.63) in 2006. On the other hand, the US had been the second largest trading partner of Indonesia from 1980 to 2003, and was the third largest from 2004 to 2006 after Japan and China. Trade between the United States and Indonesia grew strongly from US\$5712.40 million (exports of US\$4303.40 and imports of US\$1409) in 1980 and reached to US\$12598.77 million (exports of US\$7154.48 and imports of US\$5444.29) in 1997. In addition, Indonesia's trade with the United States had risen from US\$10568.74 million (exports of US\$7045.73 and imports of US\$3523.01) in 1998 to US\$16424.21 million (exports of US\$13038.30 and imports of US\$3385.91) in 2006.

In the 1980s and the 1990s, the United States and Japan had been the first and the second largest trading partners of the Philippines until 2006 except in 2004. Trade between the Philippines and both the United States and Japan had increased from US\$5067 million (exports of US\$2934.64 and imports of US\$2132.36) and US\$3755.42 million (exports of US\$1581.40 and imports of US\$2174.02) in 1989 to US\$16858.41 million (exports of US\$10492.50 and imports of US\$6365.91) and US\$10796.22 million (exports of US\$4660.35 and imports of US\$6135.87) in 1999, respectively. In 2004, the trade between the Philippines and Japan had risen to US\$15657.27 million (exports of US\$7983.39 and imports of US\$7673.88), as compared to the United States which only reached US\$15484.35 million (exports of US\$7208.66 and imports of US\$8275.69). So, the United States became the second largest trading partner of the Philippines in 2004. In 2006, the United States (US\$17011.10 million) overtook Japan (US\$14744.92 million) in terms of trade for the Philippines (International Monetary Fund, 2008).

Besides that, the United States was the second largest trading partner of Thailand after Japan from 1980 to 2006 excluding 1998. Trade between Thailand and Japan had increased roughly from US\$2934.17 million by 1980 to US\$29822.09 million by 1996. Trade between Thailand and the United States had also increased roughly from US\$2155.53 million in 1980 to US\$19824.08 million in 1997. From 1998 to 2006, trade between Thailand and both the United States and Japan grew strongly. Thailand's trade with the United States had risen from US\$18227.83 in 1998 to US\$29407.98 in 2006. For the trade between Thailand and Japan, it had increased from US\$17650.39 million in 1998 to US\$42526.10 million in 2006.

The United States and Japan are major trading partners of Malaysia. The trade between Japan and Malaysia was US\$5429 million in 1980 and increases to US\$11561 million in 1990. This value is higher compare to trade between the United States and Malaysia for the same year which is US\$3751 million and US\$9930 million respectively. Consequently, this shows that Japan is the first trading partner for Malaysia on that occasion. In period of 2000 to 2006, the United States has overtaken Japan in trading with Malaysia. The United States trades US\$46615 million in 2000 while Japan was only US\$30111 million. In 2006, both countries increased their trading with Malaysia; The United States was US\$46615 million while Japan was US\$31579 million (International Monetary Fund, 2008).

Clearly, both Japan and the United States still have an important influence on the ASEAN countries consisting of Singapore, Indonesia, the Philippines, Malaysia and Thailand. Then, two currencies (the United States dollar and Japanese yen) have always been used in transaction for trade and finance among these countries due to their economic strength in the world. Furthermore, the United States is a crucial force in the world economy. Every country must look at the economic condition in the United States before making any decision, because the United States economy can give significant impact on the world's economy. It is therefore not surprising that its currency (US dollar) is the most important in the world and has always become the basic currency for other currencies. Besides, Japanese Yen (JY) is also a second popular currency in the Asian region. Many researchers usually use these two currencies as base currencies to investigate their research issues related to Asian exchange rates (See Islam and Hasan, 2006; Baharumshah and Masih, 2005; Liew et al., 2004; Hussain and Liew, 2004; Chairoj, 2003; Baharumshah et al., 2002).

1.1 Motivation of Study

Since the seminal work of Meese and Rogoff (1983) which documented the failure of some exchange rate models. Several more recent studies found that exchange rate model may not work very well is due to omission of some macroeconomics variables. For instance, Meese and Rogoff (1988) failed to find exchange rate and monetary fundamentals cointegrating in the long-run. They pointed out that other variables should be included in their study (see also McNown and Wallace, 1989; Kearney and MacDonald, 1990; Charkabarti, 2006). This was not surprising why these authors could not find long-run relationship between exchange rate and its determinants because they only focus on monetary fundamentals like money supply, income and interest rate. However, most previous studies attempt to include other macro variables like stock price and current account and found a supportive role of exchange rate model work well. For instance, Baharumshah et al. (2002) demonstrates that stock prices are important determinant in the case of Malaysia vis-à-vis Japan and the United States². Meanwhile, Baharumshah and

² Stock prices can have either positive or negative relationship with exchange rate. It depends on whether substitution or income effect is dominant. In case of income effect, higher stock price will lead to increasing real domestic output, and hence higher demand for domestic money. At the same

Masih (2005) showed that current account differential can affect the exchange rates for Singapore and Malaysia against Japan³. Besides that, Morley (2007) suggested that stock price must be included in order to examine long-run cointegration among variables for United Kingdom against the United States.

Besides that, Meese (1986), Baillie and Selover (1987), McNown and Wallace (1989), Coughlin and Koedijk (1990), Kearney and MacDonald (1990), Edison and Pauls (1993), Throop (1994) and Rose (1996) have provided further evidence of the empirical failure of the monetary models in explaining exchange rate movements. They used the Engle and Granger (1987) two-step method to test for cointegration. This method is more appropriate in testing cointegration between exchange rate and its determinants if all the series are integrated of order one. The bound testing approach introduced by Pesaran et al. (2001) is suitable for variables that are integrated of different orders⁴.

Recently, many studies (Pattichis, 1999; Bahmani-Oskooee et al., 2002; Tang, 2002; Tang and Nair, 2002; Choong et al., 2005; Kanas and Kouretas, 2005; Tang, 2005; Akinlo, 2006; Altinay, 2007; Hosein, 2007; Ang, 2008; Shahbaz et al., 2008 and Bahmani, 2008) applied this bound testing on economics and financial issues such as money demand function, relationship between foreign direct investment and economic growth, and stock market interdependence. However, only limited exchange rate studies have applied this technique. Three exceptional exchange rate studies worth mentioning are Bahmani-Oskooee and Kara (2000), Morley (2007), and Long and Samreth (2008). These studies found supportive

time, exchange rate will appreciate. Conversely, from the perspective of substitution effect, if stock price increase, the domestic money demand may decrease because of equity is more influential in the portfolio as compared to money. Thus, increase in real stock prices will lead to lower domestic money demand and exchange rate will depreciates. In a nutshell, stock prices may have positive relationship with domestic money demand and exchange rate if income effect is dominant. Otherwise, the negative relationship will be observed if substitution effect is dominant (see for instance, Friedman, 1988; Choudhry, 1996 and Thornton, 1998).

³ When export of goods and services is less than import, domestic current account deficit will occurred. Then, home currency will depreciate. In contrast, domestic current account surpluses if export of goods and services exceed imports. Then, the home currency appreciates whereas foreign currency will depreciate (Levich, 2001).

⁴ Please refer Chapter 3, section 3.3.2, P. 46.

exchange rate with its determinants was cointegrated based on the bound testing approach⁵.

In a nutshell, this study has been motivated by at least two reasons. Firstly, it would be interesting to know the long-run relationship between exchange rate and its determinants for ASEAN countries against two major currencies (USD and JY) by employing the autoregressive distributed lag approach to cointegration pioneered by Pesaran et al. (2001). Secondly, a few studies suggested that stock prices and current account differentials are important macro variables in certain countries in Asian region, namely Malaysia and Singapore against Japan and the United States. Thus, this study would like to extend these macro variables in case of other Asian countries like Indonesia, the Philippines, Singapore, Malaysia and Thailand vis-à-vis the United States and Japan.

1.2 Statement of Problems

The study on exchange rate especially the determinants of exchange rates are important in international finance and international trade. Some researchers failed to find a valid exchange rate model. This is possibly due to lack of long-run relationship between monetary fundamentals like money supply, income and interest rate with nominal exchange rate. It means that these fundamentals and nominal exchange rate may not be related in the long-run. In other words, the monetary model may not hold empirically (Taylor, 1995; Rogoff, 1996 and Taylor and Sarno, 2002). Some studies suggested that the failure to detect such relationship between exchange rate and its fundamentals may be due to omission of some important macro variables such as stock price and current account (See for instance, Meese, 1986; Baillie and Selover, 1987 and Meese and Rogoff, 1988, Baharumshah et al., 2002; Baharumshah and Masih, 2005 and Morley, 2007). Thus, this study would like to extend these two macro variables in order to examine

⁵ Bahmani-Oskooee and Kara (2000) and Long and Samreth (2008) examines the long-run relationship between exchange rate and its fundamentals by using standard monetary model. While, Morley (2007) examines the long-run relationship between exchange rate and its economic fundamentals by using monetary model augmented with stock price. However, this study differs from them in terms of adds two macro variables, namely relative stock price and current account differential by applying monetary framework.

long-run relationship between nominal exchange rate and its determinants like money supply, income, interest rate, stock price and current account.

Furthermore, several authors postulated that previous researchers did not have advance methodology to test the monetary model in order to explain the behavioural exchange rate. For instance, by using the Engle and Granger (1987) two-step cointegration test, McNown and Wallace (1989) failed to find cointegrating vector between exchange rate and its fundamentals. Beside, other cointegration techniques are requiring the variables to be integrated of the same order that is order one (see also Meese, 1986; Baillie and Selover, 1987; Boothe and Glassman, 1987; Kearney and MacDonald, 1990). So then, this study attempts to implement the Pesaran et al. (2001) bound test approach to the analysis of long-run exchange rate and its determinants. This is a particularly relevant methodology due to its ability to test cointegrated among variables are *I*(0) or *I*(1) (Atkins and Coe, 2002 and Long and Samreth, 2008).

Note that, most of the exchange rate determination study in the Asian region and other countries have been using currencies of developed countries, such as the US dollar, British pound, German mark, and Japanese yen, as base currencies to other nations (see for example, Mark, 1995; Chinn and Meese, 1995; Chen and Mark, 1996; Culver and Papell, 1999; Baharumshah and Liew, 2000; Groen, 2000; Mark and Sul, 2001; Baharumshah et al., 2002; Bacchetta and Wincoop, 2003; Chairoj, 2003; Rapach and Wohar, 2002, 2004; Liew et al., 2004; Engel and West, 2004; Caporale et al., 2005). In this study, the Japanese Yen and the United States Dollar are the only currencies that will be applied to ASEAN exchange rate. The reason why this study employs these two currencies to Asian exchange rate is because these currencies are crucial in ASEAN countries in terms of major trading partners.

Based on the above observations, this study would like to address relevant questions of interest. Do nominal exchange rate and its fundamentals such as relatives of money supply, income, interest rate, stock price and current account have a long-run relationship in the context of selected ASEAN trading partners against the United States and Japan?

1.3 Research Questions

This study attempts to address a few interesting research questions. The questions are stated below:

- a. Do nominal exchange rate, relatives of money supply, income, interest rate, current account and stock price exhibit long-run relationship in the context of Indonesia, the Philippines, Singapore, Malaysia and Thailand against the United States?
- b. Do nominal exchange rate, relatives of money supply, income, interest rate, current account and stock price exhibit long-run relationship in the context of Indonesia, the Philippines, Singapore, Malaysia and Thailand against Japan?
- c. Are stock price and current account differentials important determinants of the exchange rates in case of Indonesia, the Philippines, Singapore, Malaysia and Thailand vis-à-vis the United States?
- d. Are stock price and current account differentials important determinants of the exchange rates in case of Indonesia, the Philippines, Singapore, Malaysia and Thailand vis-à-vis Japan?

1.4 Objective of Study

Numerous studies have empirically examined the relationship between exchange rate and its determinants in several developed countries and Asian economics in terms of Japanese yen and the United States Dollar as popular base currencies. The general objective of this study is to determine the long-run relationship between exchange rates and its determinants in case of Asian countries namely Indonesia, the Philippines, Singapore, Malaysia and Thailand against the United States and Japan. The specific objectives of this study are:

- a. To examine the long-run relationship between exchange rate with relatives of money supply, income, interest rate, stock price and current account in Indonesia, the Philippines, Singapore, Malaysia and Thailand vis-à-vis the United States.
- b. To examine the long-run relationship between exchange with relative money supply, income differential, interest rate differential, stock price differential and relative current account for Indonesia, the Philippines, Singapore, Malaysia and Thailand against Japan.
- c. To determine whether stock price and current account differentials play significant role in the determination of the exchange rate for Indonesia, the Philippines, Singapore, Malaysia and Thailand against the United States.
- d. To determine whether stock price and current account differentials play significant role in the determination of the exchange rate for Indonesia, the Philippines, Singapore, Malaysia and Thailand against Japan.

To accomplish the above objectives, this study will employ the autoregressive-distributed lag (ARDL) framework pioneered by Pesaran et al. (2001). This framework will also be applied to test for cointegration and several diagnostic tests which are employed to determine whether the results of cointegration among variables are reliable or not. The UECM model is only useful if all the series are integrated in the same order, regardless of I(0) or I(1) and all the variables are to be integrated in a different order, I(1) and I(0). However, if some variables are integrated in second order or higher order, it's not appropriate to use the bounds testing (Atkins and Coe, 2002). Besides that, the exclusion test is also applied to verify whether relatives of stock price and current account could be included or not of exchange rate determination in this study. So then, the standard integration order test pioneered by Dickey and Fuller (1979, 1981) and Said and Dickey (1984), Phillips (1987) and Phillips and Perron (1988) and Kwiatkowski et al. (1992) is to know the integration order of all variables are implemented in this study.