UNIVERSITI PUTRA MALAYSIA

THE IMPACT OF EXCHANGE RATE MISALIGNMENT AND VOLATILITY ON MALAYSIAN TRADE FLOWS

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By

MOHD NASEEM BIN NIAZ AHMAD

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfilment of the Requirements for the Degree of Master of Science

July 2007

Special dedication to……

My beloved parents & family members
and fellow friends who always prayed for my success

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Master of Science

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July 2007

Chairman   **: Associate Professor Tan Hui Boon, PhD**

Faculty   **: Economics and Management**

This study empirically examines the influence of real exchange rate behaviors, explicitly in term of its misalignment and volatility on the trade flows of a small fast-growing economy, particularly Malaysia by employing Johansen multivariate error-correction model as well as autoregressive distributed lag (ARDL) to capture the estimates of the long-run and short-run relationships over the quarterly data for the period of 1991:1 to 2003:4. A measure of the quantitative proxy of the real exchange rate misalignment is constructed through the NATREX model while the volatility of real exchange rate is generated from the GARCH (1,1) model. It is particularly crucial because international trade played as main engine to generate and sustain economic growth for small open economies. A number of important conclusions can be drawn from the study. It is observed that the Malaysian real exchange rate was overvalued before the eruption of the Asian financial crisis in 1993-1997. After the crisis, the rate was undervalued in the mid 1997-2003. The rate was stable prior to the crisis, but was very volatile during the crisis period. The empirical finding shows that the Malaysia's exports and imports are more sensitive to exchange rate

misalignment throughout the sample-study period. In the meantime, exchange rate volatility appears to be most harmful to the Malaysia's exports and imports in the post-sample period during the 1997 Asian financial crisis. On the other hand, the income effect provide a conducive condition to further boost Malaysia's exports and imports as increase in the foreign and domestic income, respectively. For the price effect, Malaysia seems to offer a competitive price of export in pre-crisis period while Malaysia's import is price inelastic through the sample period, where as a small open economy, Malaysia acts as a price taker in the international market. Nevertheless, the shift to a fixed or pegged exchange rate system is an appropriate measure as it reduced magnitude of the exchange rate misalignment and volatility (as computed through ATSSE and ATSCSD, respectively), where it may seem to be a successful case of crisis management in a small open dynamic economy, namely Malaysia.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Master Sains

KESAN KETIDAKPENJAJARAN DAN VOLATILITI KADAR TUKARAN TERHADAP ALIRAN PERDAGANGAN MALAYSIA

Oleh

MOHD NASEEM BIN NIAZ AHMAD

Julai 2007

Pengerusi   : **Profesor Madya Tan Hui Boon, PhD**

Fakulti   : **Ekonomi dan Pengurusan**

Kajian ini mengkaji kesan pengaruh tingkah laku kadar tukaran benar iaitu ketidakpenjajaran dan volatiliti terhadap aliran perdagangan bagi sebuah ekonomi yang mempunyai kadar pertumbuhan yang cepat, iaitu Malaysia, dengan menggunakan dua kaedah iaitu kaedah Johansen multivariate error-correction model dan autoregressive distributed lag (ARDL) untuk melihat hubungan jangka panjang dan pendek bagi data suku tahunan yang merangkumi tahun 1991:1 ke 2003:4. Pengukur kuantitatif proksi untuk mengukur ketidakpenjajaran kadar tukaran benar dibuat menggunakan model NATREX manakala bagi volatiliti kadar tukaran benar dibuat menggunakan model GARCH (1,1). Kajian ini penting terutamanya kerana perdagangan antarabangsa dipercayai memainkan peranan utama dalam menjana dan mempertahankan pertumbuhan ekonomi yang mampan serta memberangsangkan bagi sesebuah kuasa ekonomi kecil dan terbuka. Beberapa penemuan penting dapat disimpulkan dari kajian ini. Berdasarkan pemerhatian yang dibuat, kadar tukaran benar Malaysia didapati mengalami peningkatan nilai (overvalue) sebelum krisis kewangan Asia dalam tahun 1993-1997. Selepas krisis, kadar tukaran benar Malaysia

didapati mengalami penurunan nilai (undervalue) pada pertengahan tahun 1997-2003. Kadar tukaran benar Malaysia, juga didapati stabil sebelum krisis tetapi bertukar menjadi tidak stabil (volatile) semasa krisis. Hasil empirikal kajian menunjukkan bahawa di sepanjang tempoh masa kajian dijalankan, ekspot dan impot Malaysia didapati lebih sensitif terhadap ketidakpenjajaran kadar tukaran benar. Sementara itu, semasa krisis kewangan 1997, volatiliti kadar tukaran benar didapati mempunyai kesan negatif yang besar terhadap ekspot dan impot Malaysia. Sebaliknya, peningkatan dalam pendapatan luaran dan domestik di sepanjang tempoh masa kajian, membolehkan kesan pendapatan mencipta suatu keadaan yang kondusif untuk terus mempertingkatkan prestasi ekspot dan impot Malaysia. Bagi kesan harga, Malaysia menawarkan harga ekspot yang kompetitif bagi tempoh masa sebelum krisis, manakala harga impot Malaysia didapati tidak anjal bagi keseluruhan jangkamasa kajian, di mana sebagai sebuah kuasa ekonomi kecil dan terbuka, Malaysia dikatakan bertindak sebagai penerima harga (price taker) dalam pasaran perdagangan antarabangasa. Keputusan kajian juga mendapati bahawa, peralihan kepada rejim kadar tukaran tetap (pegged) merupakan suatu tindakan yang bersesuaian, di mana ianya dapat mengurangkan magnitud ketidakpenjajaran dan volatiliti kadar tukaran benar Malaysia (sepertimana dihitung menerusi ATSSE dan ATSCSD), yang mana, ianya boleh dikatakan sebagai suatu kes pengurusan krisis yang bertepatan bagi sesebuah kuasa ekonomi kecil dan terbuka, iaitu Malaysia.

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I certify that an Examination Committee met on 10th July 2007 to conduct the final examination of Mohd Naseem Bin Niaz Ahmad on his Master of Science thesis entitled "The Impact of Exchange Rate Misalignment and Volatility on Malaysian Trade Flows" in accordance with Universiti Pertanian Malaysia (Higher degree) Act 1980 and Universiti Pertanian Malaysia (Higher Degree) Regulations 1981. The committee recommends that the candidate be awarded the relevant degree. Members of the Examination Committee are as follows:

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This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Master of Science. The members of the Supervisory Committee are as follows:

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Date: 13 September 2007

DECLARATION

I herby declare that the thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at UPM or other institutions.

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MOHD NASEEM BIN NIAZ AHMAD

Date: 1 August 2007

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LIST OF ABBREVIATIONS

ADF	Augmented Dickey-Fuller
AFTA	ASEAN Free Trade Area
AIC	Akaike Information Criterion
APEC	Asia Pacific Economic Cooperation
ARCH	Autoregressive Conditional Heteroscedastic
ARDL	Autoregressive Distributed Lagged
ASEAN	Association of Southeast Asian Nations
ATSSE	Average Total Sum of Square Error
ATSCSD	Average Total Sum of Change of Standard Deviation
BG	Breusch-Godfery
BNM	Bank Negara Malaysia
CEPT	Common Effective Preferential Tariff
CPI	Consumer Price Index
DI	Domestic Income
DM	Deutsche Mark
ECM	Error Correction Model
FI	Foreign Income
GARCH	Generalized Autoregressive Conditional Heteroscedastic
GARCH-M	Generalized Autoregressive Conditional Heteroscedastic in Mean
GDP	Gross Domestic Product
GNP	Gross National Product
LM	Lagrange Multiplier
MIS	Misalignment
NATREX	Natural Real Exchange Rate

NEX	Nominal Exchange Rate
OECD	Organization for Economic Co-operation Development
OLS	Ordinary Least Square
PIM	Price of Import
PEX	Price of Export
PP	Phillips-Perron
PPP	Purchasing Power Parity
RIRD	Real Interest Rate Deferential
RER	Real Exchange Rate
RGC	Real Government Consumption
RGDPP	Real GDP Per capita
RM	Malaysia ringgit
SARS	Severe Acute Respiratory Syndrome
SC	Schwartz Criterion
SITC	Standard International Trade Classification
SSA	Sub-Saharan Africa
SUR	Seemingly Unrelated Regression
TOT	Terms of Trade
UECM	Unrestricted Error Correction Model
UK	United Kingdom
US	United States
USD	United State Dollar
VAR	Vector Autoregression Model
VECM	Vector Error Correction Model
VOL	Volatility
WTO	World Trade Organization

CHAPTER 1

INTRODUCTION

Malaysia, which is a part of Asian region, was developed by a clear story in terms of macroeconomic fundamental and strong financial sector until the 1997 financial crisis. In the 1990s, Malaysia exhibited strong economic performance in which inflation rate was low, unemployment was below 3%, interest rate and the exchange rate remained stable, the current account was improved and international reserves remained high. All these factors had led to an impressive economic growth around 8 percent a year of real GDP. This reflects that Malaysia was a well managed country either in terms of economic development or political stability.

This vibrant and sustained growth can be attributed to a number of factors, particularly on the foreign sector. Specifically, the liberal trade and firm exchange rate policy were the crucial elements in order to achieve a stronger foundation for the attainment of sustainable growth especially in the recent dynamic, competitive and globalize international economy. This had resulted in the rise of the export sectors through export-oriented strategy as well as stable exchange rate system that provides the means for economic enlargement and adaptability to an increasing open and global economy. Based on Sekkat and Varoudakis (2000), for over the last decades, manufactured export has become one of the most important factors for sustainable economic growth in developing countries.

However, in mid-1997 Malaysian economy was caught in a financial crisis that arose from a regional contagion effect. This leads Bank Negara Malaysia (hereafter BNM)

to implement temporary policy in September 1998 which included foreign exchange restriction on capital flows and pegged exchange rate to the US dollar at RM3.8/1USD. The objectives were to eliminate transactions that close the offshore market, suspend ringgit credit to foreigners and reduce outflows as well as to insulate the domestic economy from the effect of short-term capital flows[1]. Moreover, 1998 political instability, slowdown in global economic due to the uncertainties created by 11 September attack, the war in Iraq and SARS have plunged real GDP by 7.4 percent in 1998.

Although, Malaysian economy has remained relatively open to investment of FDI, trade flows, dividends, interest and rental income earned therein continued the liberalization development of the trade and investment regimes. In second quarter of 1999, the Malaysian economy has recovered with GDP growing by 6.1 percent[2]. This economic turnaround was underpinned by the ringgit stabilization and strong exports growth owing to the fact that Malaysia's trading partners kept their markets open throughout the crisis[3]. By 2004 Malaysian economy continue to grow by an impressive 7.1 percent of real GDP.

Bearing in mind the heavy dependence of the Malaysian economy on the external sector in managing the economic development and providing role to boost the economic growth, induced an attractive issue to investigate the dynamic of the external sector particularly the relationship of Malaysia's foreign trade and its

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[1] See Hood. R. (2001)

[2] The Malaysian economy had recovered from the 1997 Asia financial crisis and was on the stronger growth of real GDP which turned positive since second quarter of 1999 and had continued to grow strongly for 7 consecutives quarters (Economic Report, 2001/2002).

[3] This is due to the strong demand on Malaysian electronic and electrical products which increases vulnerability to the fluctuations in global demand for the products wherein the surge in global demand for information and communication technology goods pulled Malaysia out of the recession in 1999 (WTO, 2006).

exchange rate arrangement through different regimes. This is due to the crucial role played by the exchange rate policy in stimulating the performance of international trade in developing countries, (Sekkat and Varoudakis, 2000).

The mismanagement of economic policies among the developing countries has led to an inefficient exchange rate policy, which brings to the exchange rate behaviors such as real exchange rate misalignment and volatility that may have been damaging to economic performance. It can be deduced that the traditional determinants of trade that do not include a variable representing the influence of exchange rate behaviors such as exchange rate volatility are potentially misspecified, (Arize, 1995, 1996 and 1997). Thus, the linkages among the variables of external trade flows and the exchange rate behaviors are important finding for policy makers in order to lead to an elevated economic achievement by implementing appropriate monetary and fiscal policies.

For that reason, this study is vital and relevant particularly in the sane of an emerging economy; Malaysia, in order to ascertain the impact of exchange rate behaviors on trade flows, given that such impact vary across different exchange rate regimes. In general, most of the previous studies identified the impact of exchange rate volatility on exports among developed countries whilst there are only a few studies focused on import flows and the impact of exchange rate misalignment on trade flows. Hence, this study attempts to extend the previous findings in a more comprehensive setting in order to explore in details about the knowledge of this discipline.

Nonetheless, the contribution of external sector on economic growth specifically the growth of real GDP is extremely pronounced. Therefore, this study portrays an interesting issue to maneuver especially in long run and many endeavors have contributed to investigate such relationship. The findings are important for policy makers to have a clearer idea in implementing effective economic measures. As a result, the issue of trade flows with the behaviors of exchange rate has received considerable concern. In this regard, this study intended to examine the causal effect on the impact of both exchange rate misalignment and volatility on exports and imports, respectively across two different exchange rate regimes for the case of Malaysia. An overview of the Malaysian economy ranging from 1990 to 2004 will be provided in Table 1.1 to illustrate some information on the economic indicators.

Table 1.1: The Performance of Malaysian Economy from 1990 to 2004

	1990	1992	1994	1996	1998	2000	2002	2004
Gross Domestic Product (%)	11.9	12.2	15.2	11.1	5.4	13.9	8.3	13.8
Gross National Product (%)	11.5	11.9	15.2	10.3	4.4	12.1	9.1	14.1
Unemployment (%)	4.6	2.9	3.0	2.5	3.2	3.1	3.5	3.5
Investment Public (%)	19.7	29.9	2.3	11.9	9.9	26.9	11.4	-6.7
Investment Private (%)	27.6	1.4	28.8	12.8	-21.5	40.6	-14.9	28.6
Export (%)	18.9	9.0	28.2	13.1	6.0	17.0	6.6	21.7
Import (%)	30.8	2.2	22.9	13.7	5.1	23.8	6.5	23.0
Consumer Price Index (%)	3.1	4.7	3.7	3.5	5.3	1.4	1.5	1.4
External Debt (%)	-1.5	-2.3	14.0	15.1	-5.3	-0.7	7.1	7.5

Source: Economic Report, several issues
Note: All figures are in annual percentage changes.

1.1 Issues on the Impact of Exchange Rate Misalignment and Volatility on Trade Flows

As a trading nation, Malaysia relies deeply on its external sector with export and FDI inflows played as the main engine of economy growth. This implies that, Malaysia is actively engaged in the international trade where exchange rate plays an important

role from the fact that it can be used as an indicator of the international competitiveness of a country. Therefore, any shock that occurred in the economy is pertained to the rate of exchange, which in turn tends to cause vital impact on the international trade flows. This impact can be divided into two separate effects based on the exchange rate behaviors such as exchange rate misalignment and exchange rate volatility in which may impede or hasten trade flows.

The issue of exchange rate behaviors and its impact on trade flows poses a number of questions and challenges for over several decades. This had attracted a debate among policy makers and researchers specifically on the impact of the exchange rate misalignment and volatility on trade flows either in terms of exports or imports since there is no consensus among economists to date on how exchange rate misalignment and the volatility of exchange rate influences trade volume from both theoretical and empirical perspectives.

The misalignment of exchange rate may distort international trade as it deforms a comparative advantage which is the basis of the Racardian theory of international trade. This is because a situation of exchange rate misalignment in term of exchange rate overvaluation leads to increase in the quantity of imports but decreases the quantity of exports. This could be due to the appreciation of the exchange rate which reduced the cost of imported inputs as well as the cost of trading abroad. In this regards, recent analyses by Bouoiyour and Rey (2005) found empirical evidence to support the assertion that misalignment overvaluation negatively affect exports whilst positively pretentious imports. At the same time, exchange rate misalignment in term of exchange rate undervaluation could be attributed to competitive