DOMESTIC MACROECONOMIC ADJUSTMENT TO OIL PRICE SHOCKS UNDER DIFFERENT EXCHANGE RATE REGIMES IN MALAYSIA.

CHONG HUI ING

SCHOOL OF BUSINESS AND ECONOMICS
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BORANG PENGESAHAN STATUS TESIS [a]

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IJAZAH: SARJANA EKONOMI (EKONOMI KEWANGAN)

SESI PENGAJIAN: 2005-2007

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DECLARATION

The materials in this thesis are original except for quotations, excerpts, summaries and references, which have been duly acknowledged.

CHONG HUI ING
PS05-002-073
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ABSTRACT

This thesis examines on the insulation properties of flexible exchange rate regime against fixed exchange rate regime from oil price shocks. A monthly sample 1980-2005 from Malaysia is investigated whether the response of output, exchange rate and price level to oil price shocks are different across exchange rate regimes in the short run by applying Structural Vector Autoregressive model. The oil prices are found to be exogenous to the macroeconomic variables in Malaysia. Results show that the short run output responses to oil price disturbances are smoother under flexible exchange regime than fixed exchange regime. And there is asymmetric response of domestic variables to positive and negative oil price shocks across and within exchange regimes.

ABSTRAK

PENYESUAIAN MAKROEKONOMI DOMESTIK TERHADAP KEJUTAN HARGA MINYAK DI BAWAH SESTEM KADAR PERTUKARAN YANG BERLAINAN DI MALAYSIA.

Tesis ini mengkaji ciri-ciri penyingkiran sistem kadar pertukaran boleh ubah berbanding dengan sistem kadar pertukaran tetap daripada kejutan harga minyak. Satu sampel bulanan 1980-2005 dari Malaysia dikajikan sama ada tindak balas output, kadar pertukaran dan tingkat harga terhadap kejutan harga minyak adalah berlainan di bawah sistem kadar pertukaran yang berbeza dengan mengaplikasikan model "Structural Vector Autoregressive". Harga minyak didapati eksogen kepada pembolehubah makroekonomi di Malaysia. Keputusan menunjukkan bahawa tindak balas jangka pendek output terhadap kejutan harga minyak adalah lebih licin di bawah sistem pertukaran boleh ubah daripada sistem pertukaran tetap. Tindak balas asimetri pembolehubah domestik terhadap kejutan harga minyak positif dan negatif wujud antara dan dalam sistem pertukaran.

LIST OF ABBREVIATIONS

ADF	Augmented Dickey-Fuller
AIC	Akaike Information Criteria
CFA	*Coopération financière en Afrique centrale* (for Central Africa)
CFA	*Communauté financière d'Afrique* (for West Africa)
CPI	Consumer Price Index
EIA	Energy Information Administration
EMS	European Monetary System
GARCH	Generalized Autoregressive Conditional Heteroskedasticity
GDP	Gross Domestic Product
GNP	Gross National Product
IFS	International Financial Statistics
IMF	International Monetary Fund
M1	Monetary Aggregate 1
M2	Monetary Aggregate 2
NYMEX	New York Mercantile Exchange
OECD	Organization of Economic Co-operation and Development
OLS	Ordinary Least Square
PPI	Producer Price Index
UNCTAD	United Nations Conference on Trade and Development
VAR	Vector Autoregressive
VARX	Vector Autoregressive with Exogenous Variables
VECM	Vector Error Correction Model
WTI	West Texas Intermediate

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GLOSSARY

Endogenous	Variables with values determined inside the model.
Exogenous	Variables with value that is not explained within the model.
Fixed rate regime	A system in which a country maintains a fixed value of its currency in terms of other currencies.
Flexible rate regime	Rates that are completely free to vary; that is, the foreign exchange market is cleared at all times by changes in the exchange rate.
Globalization	The growing economic interdependence of countries worldwide through increasing volume and variety of cross-border transactions in goods and services, free of international capital flows and more rapid and widespread diffusion of technology.
Impulse responses	Trace out the pattern of response of current and future values of each of the variables to one unit increase in the current value of one VAR error terms.
Managed float system	A system with some intervention in foreign exchange market by monetary authorities with exchange rate movements to smooth out short run fluctuations without keeping exchange rates rigidly fixed.
Matrix algebra	Provides a compact method than scalar algebra in handling regression models.
Moving average	Linear combination of white noise error terms.
Oil price shocks	An unexpected disturbance or unexplained movements in oil prices, reflecting the influence by exogenous factors.
Price stickiness	The tendency of prices to adjust only slowly to changes in the economy.
Structural VAR model	Combine statistical methodology of basic VARs with a number of widely accepted long run restrictions derived from economic theory to recover the underlying economic shocks.
Variance decomposition	Percentage of the variance of the error made in forecasting a variable due to a specific shock in a given horizon.
West Texas Intermediate	One of the leading benchmark of high quality crude oil prices which is referred in the United States and the world.

KEYWORDS

Exchange rate regimes, Oil price shocks, Macroeconomic variables, Structural VAR model, Malaysia.

CHAPTER 1

INTRODUCTION

1.1 Introduction

The world has started to globalize since the cross border flows of trade has started around 1870s (World Bank, 2005) and economists have been long aware of this global economy trade since the Ricardian theory in 1880s. The realization of the flexible exchange rate regime in insulating the economies against foreign shocks in the early 1950s by Friedman (1953) encouraged the development of floating exchange rate system since early of 1970s. [1]

Nowadays, markets for merchandise are much more integrated than ever before. Many developing countries have broken into the world markets for manufactured goods and services since 1980s (World Bank, 2005). This increasing of economic interdependence through the cross border flows of trade and financial can further support through simple proxies as shows in Figure 1.1 and 1.2. Figure 1.1a and 1.1b indicate the index of the openness for goods and services market has increased markedly for many countries especially in the case of Malaysia since 1970s.[2] Figure 1.2a and 1.2b show a strong growth in the foreign direct investment (FDI), as proxied by the share of FDI stocks to output.[3] This is further supported by

[1] The terms "floating" and "flexible" is used interchangeably.
[2] The common indicator use to measure the degree of an economy's openness is the percentage of total trade as a share of national income.
[3] According to Prasad et al. (2003: 12), stock data is a better indication of capital market integration since it is accumulation of capital flows through relevant valuation adjustments.

Figure 1.1: Trade and Share of Trade to GDP

Figure 1.1a: World

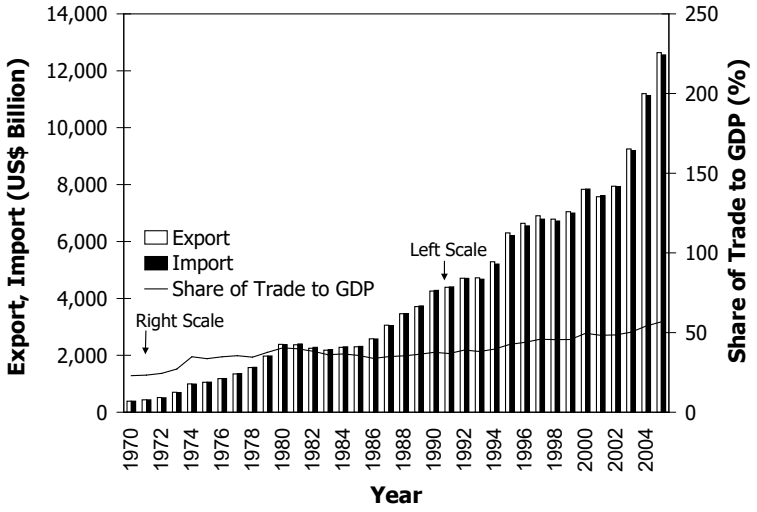
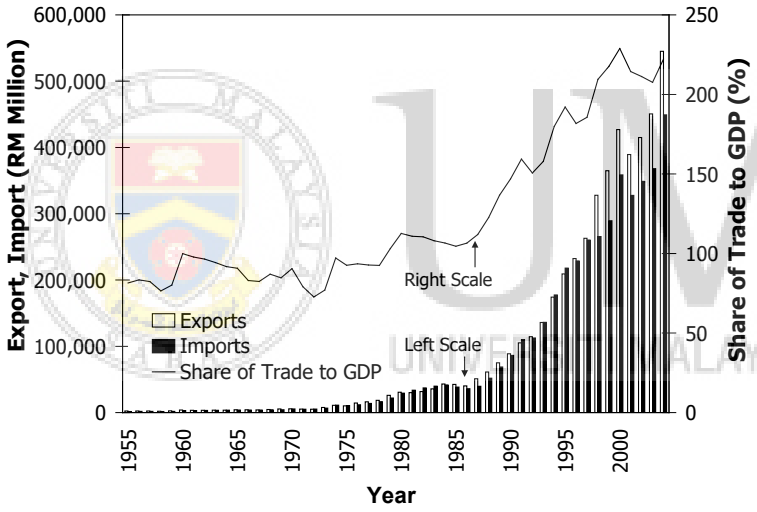


Figure 1.1b: Malaysia



Source: IMF

Prasad et. al. (2003: 15), who indicated that the financial restriction has decreased as financial openness has increased in both industrial and developing countries since 1970s.

The factual discussed above shows the cross border trade and capital flows are increasing, which leaves many nations more vulnerable to unexpected international economic shocks. The monitor of the international economic development therefore become crucially important since an economy with relatively

Figure 1.2: FDI and Share of FDI to GDP

Figure 1.2a: World

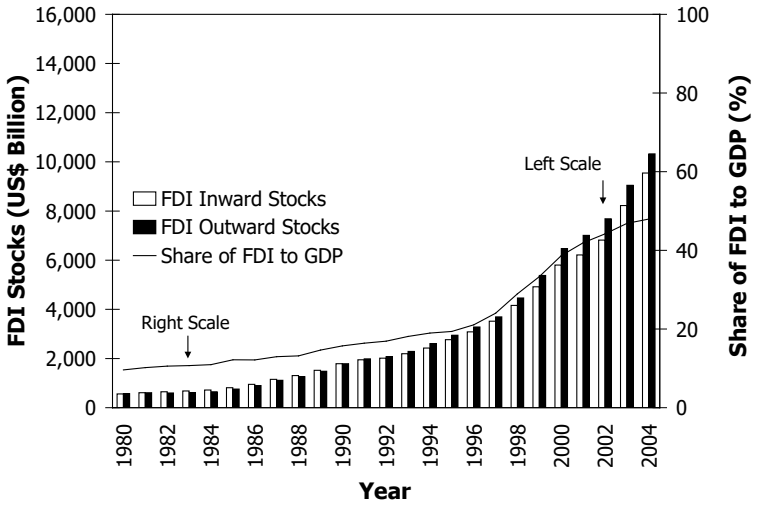
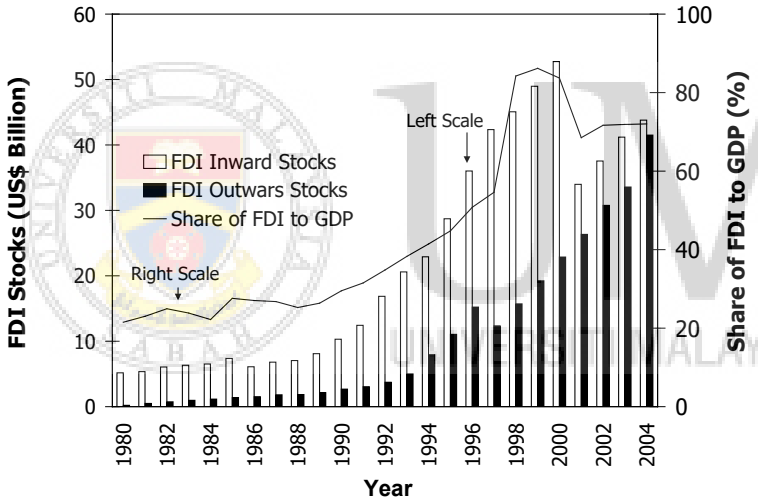


Figure 1.2b: Malaysia



Sources: IMF and UNCTAD

high degree of openness likes Malaysia will be affected more by outside world. As an alternative, the understanding of flexible exchange rates as a tool to mitigate the foreign shocks can help nations to react better to the international economic development, as predicted by Friedman's (1953) hypothesis.

1.2 Statement of Problem

Malaysia is a small, trade dependent economy with a high degree of foreign presence in both the real and financial sectors. International economic development thus has a significant impact on Malaysian economy. Unexpected change originating abroad from time to time can transmit and affect on the macroeconomic performance, which can be measure by Malaysian macroeconomic variables. On the international context, the direction on the oil prices is a major concern. The changes of international oil prices are uncertainty, for example, there is a slightly declining trend of the oil prices in the late of 2006 by easing political concerns and no expected hurricane season in the United States, instead of continuing increase of price of oil in the early 2000s until a peak in July 2006.

Since oil price shocks have a impact on domestic macroeconomic variables, the role of exchange rate regimes in mitigating the impact of these oil price shocks on domestic macroeconomic variables therefore become an interesting issue. This study will investigate the adjustment process of domestic macroeconomic variables in order to test the effectiveness of flexible exchange rates in insulating the Malaysia macroeconomic variables from oil price shocks.

1.3 Research Questions

The research questions for this study are stated as follows:

1. Is the long run relationship existed between oil price shocks and domestic macroeconomic variables?
2. Is the oil price shock exogenous within a set of domestic macroeconomic variables?
3. What is the response pattern of each domestic macroeconomic variable to oil price shocks under alternative exchange rate regimes?

4. Is the response pattern of domestic macroeconomic variables the same to the oil price increases as to the oil price decreases?
5. How importance is the oil price shocks in explaining the overall variance of domestic macroeconomic variables?

1.4 Objectives of Study

The purposes for this study are stated as follows:

1. To examine the cointegration and exogeneoty of oil prices with domestic macroeconomic variables.
2. To analyze the insulating properties of floating exchange rate regime against fixed exchange rate regime from the oil price shocks. Explicitly, the adjustment process of exchange rates, price level and output in response to the oil price shocks is compared under different exchange rate regimes.
3. To analyze the asymmetric effect of the positive and negative oil price shocks on exchange rates, price level and output within and across the exchange rate regimes.
4. To measure the relative importance of the oil price shocks in explaining the overall variance of exchange rates, price level and output.

1.5 Significance of Study

Different exchange rate regimes have advantages and disadvantages. For example, fixed rate regime can reduce exchange rate volatility and stimulating trade, investment and growth. While economic with floating rate regime has greater ability to adjust to external shocks. This study intends to contribute as a guideline on the effects of the foreign shocks, or unexpected change originating abroad, on the domestic economies under different exchange rate regimes through statistical

analysis. An understanding of the insulating properties of exchange rate from foreign disturbances to domestic economies can help the policymakers and investors to monitor international conditions in order to properly react to these undesirable foreign disturbances.

Past studies examined on this issue focused on terms of trade shocks, natural shocks and foreign macroeconomic variables shocks such as output, interest rate, price level and money supply shocks (Lastrapes and Koray, 1990; Hutchison and Walsh, 1992; Broda, 2004; Edwards and Levy Yeyati, 2005; and Ramcharan, 2005). On the other hand, studies examine on the relationship between oil price shocks and output did not include the role of the exchange rate (Hamilton, 1983; Mork, 1989; Mork, Olsen and Mysen, 1994, Hooker, 1996; Lee, Ni and Ratti, 1995; Ferderer, 1996; and Guo and Kliesen, 2005). This study fill such a gap in current literature as it focuses on the adjustment process of domestic macroeconomic variables in responses to the oil price disturbances under different exchange rate regimes in Malaysia.

1.6 Scope of Study

Instead of asking whether the economic policies such as monetary policy, fiscal policy or trade policy can help to stabilize the output, the study examines if fixed or floating exchange rates can help to achieve this objective. Study is concerned with 'normal times' but not focuses on special economic events since there are many interesting economic variations besides these events. And the study is conducted from 1980 to 2005 for Malaysia.

1.7 Organization of Study

The remainder of the study arrange as follows. Chapter two describes background of this issue in the case of Malaysia. The following chapter reviews the Friedman's (1953) theory and some related literature. Chapter four outlines the econometric framework employs in this study. Chapter five reports the empirical results. And the final chapter provides a summary and implications of the study's findings besides discusses some limitations and suggestions for future study.

CHAPTER 2

BACKGROUND OF STUDY

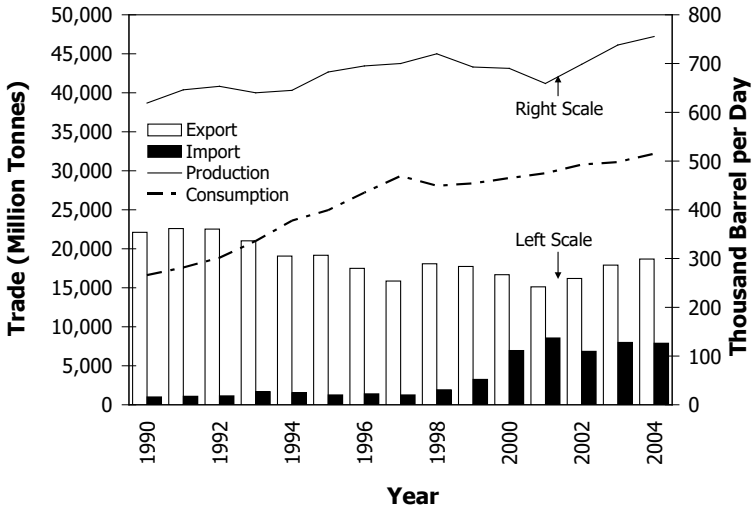
2.1 Introduction

Chapter two briefly reviews the important of the international world crude oil prices in influencing Malaysian economy and the development of exchange rate regimes in Malaysia.

2.2 Malaysia as a Price Taker of Crude Oil

Malaysia is a crude oil producer and a net exporter country of crude oil. Since the consumption of the crude oil is less than the production capacity in Malaysia as shows in Figure 2.1, Malaysia is exporting the crude oil. At the same time, Malaysia also importing crude oil for consumption as Malaysia can earn more from the higher quality of produced and exported crude oil, namely Tapis. Figure 2.1 indicates that the gap for the volume of exports against imports, and the production compare with consumption of crude oil become smaller over 1990 to 2004. This is further proven through Table 2.1, which shows the share of crude oil production to gross domestic product (GDP) and percentage exports of crude oil to total exports in Malaysia indicates a declining trend. Moreover, the share of the crude oil production in Malaysia to the world crude oil production is less than 2%. Therefore, Malaysia is a crude oil price taker from international crude oil market since Malaysia is a small oil producer country as compare with the world crude oil production.

Figure 2.1: Malaysia Production, Consumption, Exports and Imports of Crude Oil



Source: Department of Statistics, Malaysia and EIA

Table 2.1: Malaysia Production and Exports of Crude Oil

Year	Percentage			Year	Percentage		
	PG	EE	PP		PG	EE	PP
1991	8.98	10.79	1.07	1998	7.88	2.63	1.08
1992	8.63	8.80	1.09	1999	7.93	2.89	1.05
1993	7.54	6.54	1.06	2000	7.31	3.82	1.01
1994	7.32	4.25	1.06	2001	7.18	3.34	0.97
1995	8.19	3.62	1.09	2002	7.17	3.25	1.04
1996	7.66	3.66	1.09	2003	7.20	3.94	1.07
1997	7.27	3.20	1.07	2004	6.98	4.53	1.05

Sources: Department of Statistics, Malaysia; Ministry of Finance, Malaysia; and EIA
Note: PG: Share of Malaysia crude oil production to Malaysia GDP
EE: Share of Malaysia crude oil export to Malaysia total export
PP: Share of Malaysia crude oil production to world crude oil production

2.3 Impact of Changes of Oil Prices on Malaysia

Oil is a primary commodity for the world economy - as a raw material in manufacturing industries and is a source of transport fuel. It therefore has an inelastic demand in the short term, in which a slightly drop in crude oil supply will result in large hikes in the international oil prices.

Figure 2.2: Prices of Crude Oil and Petroleum Products

Figure 2.2a: World Prices of Crude Oil

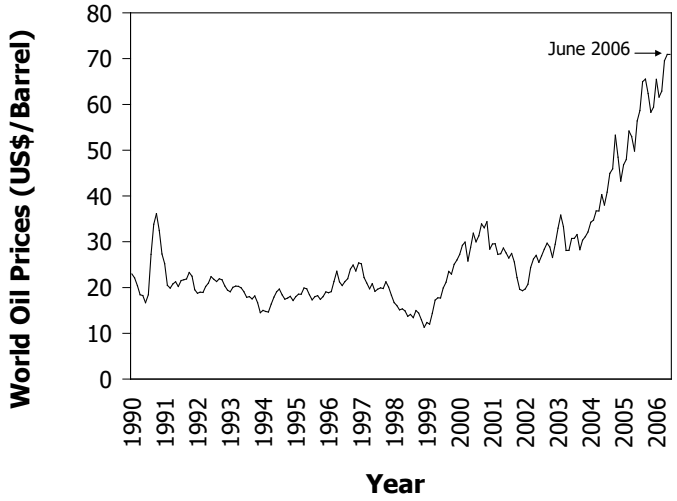
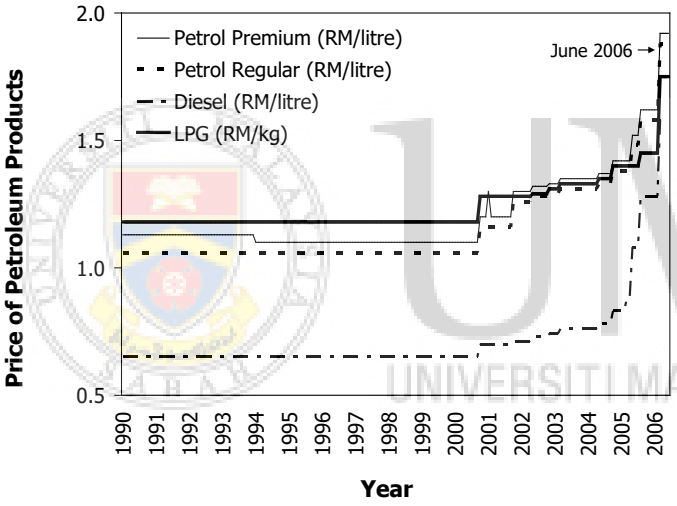
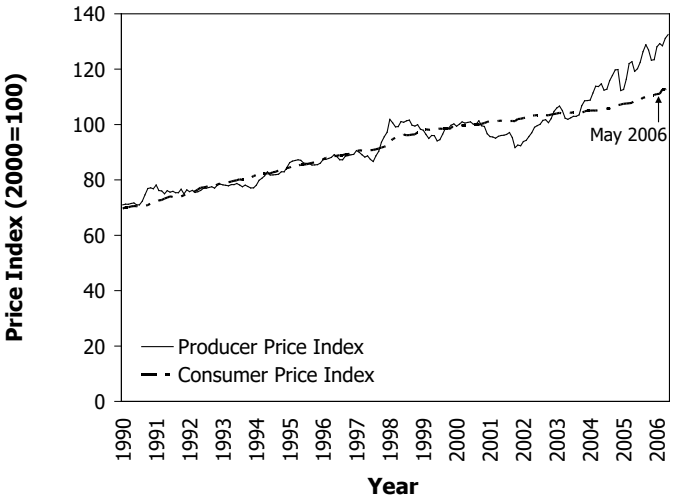


Figure 2.2b: Malaysia Retail Prices of Petroleum Products



Source: IMF and Ministry of Domestic Trade and Consumer Affairs

Figure 2.3: Malaysia Producer Price Index and Consumer Price Index



Source: IMF