IS FOREIGN DIRECT INVESTMENT PANACEA FOR UNEMPLOYMENT? THE CASE OF MALAYSIA

BY

HO WEI XIN

LAU SIN YI

LEE ZI TONG

TAN WEI BOON

A research project submitted in partial fulfillment of the requirement for the degree of

BACHELOR OF ECONOMICS (HONS)
FINANCIAL ECONOMICS

UNIVERSITI TUNKU ABDUL RAHMAN

FACULTY OF BUSINESS AND FINANCE
DEPARTMENT OF ECONOMICS

AUGUST 2014

DECLARATION

We hereby declare that:

(1) This undergraduate research project is the end result of our own work and that due acknowledgement has been given in the references to ALL sources of information be they printed, electronic, or personal.

(2) No portion of this research project has been submitted in support of any application for any other degree or qualification of this or any other university, or other institutes of learning.

(3) Equal contribution has been made by each group member in completing the research project.

(4) The word count of this research report is 11160.

	Name of Student:	Student ID:	Signature:
1.	HO WEI XIN	11ABB06674	_________________
2.	LAU SIN YI	10ABB06782	_________________
3.	LEE ZI TONG	10ABB03077	_________________
4.	TAN WEI BOON	11ABB06675	_________________

Date: August 27, 2014

ACKNOWLEDGEMENT

The completion of this research required the help of various individuals. Without them, we might not meet our objectives in doing this research. Therefore, we would like to give our gratitude to the people for their invaluable help and support in our research.

First and foremost, we would like to express our sincere thanks of gratitude to our supervisor, Ms. Siti Rohaya Binti Mat Rahim who has helped and supported us all the time of research. Our research project could not complete without her guidance because of her patience, motivation, enthusiasm and immense knowledge in the field of economics. We are greatly indebted to her for supervising our group when we have encountered numerous obstacles from data collection, analysis and interpretation. Besides that, we will always cherish the wonderful experience of working with her.

We would also like to thank our project coordinator, Ms. Lim Shiau Mooi, for coordinating everything pertaining to the completion undergraduate project and keeping us updated with the latest information regarding it. We do really appreciate her willingness to clarify to us when we confused about the requirement that we had to meet for our project.

Furthermore, we would like to offer our regards and blessing to all of those who supported in any respect during the completion of the project, particularly to our second examiner, Ms. Tan Ai Lian, who has guided us directly and indirectly with new insights and ideas in finalizing the project within the limited time frame.

Last but not least, this project would have not been done without the team spirits, hardwork and the enormous work pressures that we faced together. We are very appreciative on such a team spirit. We would also like to thank to our parents and friends who supported and helped us a lot on the path of completing this research.

TABLE OF CONTENTS

		Page
Copyright Page	…………………………………………………………	ii
Declaration	…………………………………………………………	iii
Acknowledgement	…………………………………………………………	iv
Table of Contents	………………………………………………………..	v
List of Tables	…………………………………………………………	vii
List of Figures	………………………………………………………....	viii
List of Abbreviations	…………………………………………………………	ix
List of Appendices	…………………………………………………………	x
Preface	………………………………………………………..	xi
Abstract	…………………………………………………………	xii
CHAPTER 1	RESEARCH OVERVIEW	
1.0	Overview …………………………………………………	1
1.1	An Overview of Foreign Direct Investment (FDI)...……...	1
1.2	Research Background ………………………………….	3
1.3	Problem Statement ……………………………………..	8
1.4	Research Objectives ……………………………………...	10
	1.4.1 General Objective ………………………………...	10
	1.4.2 Specific Objectives ……………………………….	10
1.5	Research Questions …………………………………….	11
1.6	Significance of the Study ………………………………	12
	1.6.1 Academia …………………………………………	12
	1.6.2 Policymaker ………………………………………	12
1.7	Chapter Layout …………………………………………...	13
CHAPTER 2	LITERATURE REVIEW	
2.0	Overview …………………………………………………	14
2.1	Unemployment and FDI Inward ………………………….	14
2.2	Unemployment and FDI Outward ………………………..	18
2.3	Unemployment, FDI Inward and FDI Outward …………..	19
CHAPTER 3	METHODOLOGY	
3.0	Overview …………………………………………………	20

	3.1	Data Description …………………………………………	20
	3.2	Unit Root Tests …………………………………..….	24
	3.3	Diagnostic Checking …………………………………...	26
		3.3.1 Stability Condition ………………………………..	26
		3.3.2 Normality Test ……………………………………	27
		3.3.3 Breusch-Godfrey Serial Correlation LM Test ……	28
	3.4	Vector Autoregressive (VAR) Model …………...….….…	28
	3.5	Granger Causality Test, Impulse Response Function and Forecast Error Variance Decomposition ………………….	32
CHAPTER 4		RESULTS AND INTERPRETATION	
	4.0	Overview ………………………………………………….	34
	4.1	Unit Root Tests …………………………………………...	34
	4.2	Lag Length Selection ……………………………………..	36
	4.3	Diagnostic Checking …………………………………...	37
		4.3.1 Stability Condition ………………………………..	37
		4.3.2 Normality Test ……………………………………	38
		4.3.3 Breusch-Godfrey Serial Correlation LM Test ….....	39
	4.4	Vector Autoregressive (VAR) Model ……………………	40
		4.4.1 VAR Estimate ………………...………………..	40
		4.4.2 Granger Causality Test ……..……………..…...	41
		4.4.3 Impulse Response Function ……………………....	42
		4.4.4 Variance Decomposition ………………………….	44
CHAPTER 5		CONCLUSION	
	5.0	Overview ………………………………………………….	47
	5.1	Major Findings ……………………………………………	47
	5.2	Policy Implications ………………………………………	48
	5.3	Limitations and Recommendations for Future Studies …...	50
References ……………………………………………………………			52
Appendices …………………………………………………………...			54

LIST OF TABLES

		Page
Table 4.1.1	Augmented Dickey-Fuller (ADF) Test ……………………	35
Table 4.1.2	Philips-Perron (PP) Test ………………………………...	35
Table 4.1.3	Kwiatkowski-Philips-Schmidt-Shin (KPSS) Test …………	35
Table 4.2.1	Lag Length Selection ……………………………………...	36
Table 4.3.3.1	Breusch-Godfrey Serial Correlation LM Test ……………..	39
Table 4.4.2.1	Granger Causality Test …………………………………….	41
Table 4.4.4.1	Variance Decomposition of LUE to LFDI_I and LFDI_O..	44
Table 4.4.4.2	Variance Decomposition of LFDI_I to LFDI_O …………..	45
Table 4.4.4.3	Variance Decomposition of LFDI_O to LFDI_I …………..	46

LIST OF FIGURES

		Page
Figure 1.2.1	Malaysia's Foreign Direct Investment (FDI), Net Inflow and Unemployment Rate from 1976 to 2012 ……………….	4
Figure 1.2.2	Malaysia's Foreign Direct Investment (FDI), Net Outflow and Unemployment Rate from 1999 to 2013 ……………….	7
Figure 4.3.1.1	Stability Condition of Model …………………………………	37
Figure 4.3.2.1	Normality of Residuals (Jarque-Bera Test) ………………...	38
Figure 4.4.3.1	Impulse Response of LUE to LFDI_I and LFDI_O ………..	42
Figure 4.4.3.2	Impulse Response of LFDI_I to LFDI_O …………………..	43
Figure 4.4.3.3	Impulse Response of LFDI_O to LFDI_I …………………..	43

LIST OF ABBREVIATIONS

ADF	Augmented Dickey-Fuller
AIC	Akaike Information Criterion
AR	Autoregressive
CGE	Computable General Equilibrium
DF	Dickey-Fuller
FDI	Foreign Direct Investment
FPE	Final Prediction Error
GDP	Gross Domestic Product
GMM	Generalized Method of Moments
GNP	Gross National Product
HQ	Hannan-Quinn Information Criterion
KPSS	Kwiatkowski-Phillips-Schmidt-Shin
LFDI_I	Logarithmic Foreign Direct Investment Inward
LFDI_O	Logarithmic Foreign Direct Investment Outward
LOG	Logarithm
LUE	Logarithmic Unemployment Rate
M&A	Mergers and Acquisitions
OLS	Ordinary Least Square
PP	Phillips-Perron
R&D	Research and Development
RM	Ringgit Malaysia
SIC	Schwarz Information Criterion
UK	United Kingdom
US$	United States Dollar
VAR	Vector Autoregressive
VECM	Vector Error Correction Model

LIST OF APPENDICES

		Page
Appendix 1	Unit Root Tests	
1.1	Augmented Dickey-Fuller Test – (Level Form - Stationary Intercept with No Trend) ……………………………………….	54
1.2	Augmented Dickey-Fuller Test – (Level Form - Stationary Intercept with Trend) ………………………………………...	57
1.3	Philips-Perron Test - (Level Form - Stationary Intercept with No Trend) ………………………………………………………	60
1.4	Philips-Perron Test - (Level form - Stationary Intercept with Trend) …………………………………………………………..	63
1.5	Kwiatkowski-Phillips-Schmidt-Shin (Level Form - Stationary Intercept with No Trend) ………………………...	66
1.6	Kwiatkowski-Phillips-Schmidt-Shin (Level Form - Stationary Intercept with Trend) …………………………….	69
Appendix 2	Diagnostic Checking	
2.1	Lag Order Selection Criteria ………………………………...	72
2.2	Inverse Roots of AR Characteristic Polynomial …………….	73
2.3	Breusch-Godfrey Serial Correlation LM Test ……….……...	74
2.4	Normality Test (Jarque-Bera Test) …………………………..	75
Appendix 3	Vector Autoregressive (VAR) Model	
3.1	Vector Autoregression Estimates ……………………………	76
3.2	Granger Causality Test ………………………………………	77
3.3	Impulse Response Function …………………………………	78
3.4	Variance Decomposition …………………………………….	79

PREFACE

This research paper is submitted as a part of the requirement to fulfill for the Bachelor of Economics (Hons) Financial Economics course. We are interested about the unemployment and foreign direct investment in Malaysia. Therefore, we set our research topic as “Is Foreign Direct Investment Panacea for Unemployment? The Case of Malaysia”. It revolves around the relationship between the foreign direct investment and unemployment in Malaysia. Foreign Direct Investment (FDI) is one of the key drivers in speeding up the development and economic growth in Malaysia. Sound macroeconomic management, presence of a well-functioning financial system and sustained economic growth has made Malaysia an attractive country for FDI. Moreover, FDI plays a crucial role in Malaysia economy as it creates more job opportunities. The job opportunities created by FDI have help to reduce the unemployment in Malaysia. The unemployment problem is concern by every country because high in unemployment mean low gross domestic product. Meanwhile, a country in the condition of high unemployment, the growth of the county will be slow down.

ABSTRACT

This study aims to find out whether FDI is a panacea to the unemployment in the case of Malaysia during 1999 to 2013. The reason of choosing Malaysia as our target in this research is that the Malaysia's unemployment rate has been maintained at efficient level over the decades and also because of Malaysia has doing well in attracting FDI. Therefore, these two rationales has inspired us by lifted our concern and motivated us to conduct an empirical analysis to examine the impact of Malaysia's FDI inward, FDI outward and unemployment. We are using the logarithmic data of FDI inward, FDI outward and unemployment from the first quarter of 1999 to the fourth quarter of 2013. By applying of VAR model in level form, the result show that FDI inward and FDI outward have an impact to unemployment in the short run, but not in long run. VAR method of impulse response function indicated that both FDI inward and FDI outward have a negative impact on unemployment. Besides that, impulse response function indicated that there is a positive relationship between FDI inward and FDI outward. Since FDI inward has the significant relationship with FDI outward, so both variables are playing a crucial role to influence Malaysia's unemployment. Based on variance decomposition, it shows noticeably that FDI inward have a greater impact compared to the FDI outward on unemployment. Current policies have to be revisited in order to attract more FDI, so that the country will be greatly contributed and becomes a developed nation.

CHAPTER 1: RESEARCH OVERVIEW

1.0 Overview

This chapter began with the research background that has inspired us to conduct this research by discussing about the foreign direct investment associated with Malaysia's unemployment. With the aids of graphical analysis, we understand about the trend of unemployment rate in Malaysia. Several ideas have highlighted in the research background in an attempt to form the problem statement of our research. After that, research objectives and research questions are identified in respect of how the research will be carried out. Last but not least, the significance of study is discussed in this section as well.

1.1 An Overview of Foreign Direct Investment (FDI)

Foreign direct investment (FDI) is defined as an investment made by a company in one country to acquire substantial shares of another company in foreign country. Har et al. (2008) further explained that FDI is an international capital flows that a company in one country established a subsidiary in another country. Hence, the company makes direct investment has a major degree of influence and control over the company into which the investment is made. This implied that engage in FDI is not only transferring the resources but it also involve in acquisition of control.

Companies commonly considered FDI because it can promote their company profitability and improve shareholder wealth. According to Asari et al. (2011), they stated that FDI may improve welfare of the host country due to its advantages, for example, introduction of new and advanced technologies and innovations, managerial and marketing expertise, economies of scale and scope, financial strength, job opportunities and better working conditions. In most cases, companies involve in FDI are to boosting revenues, minimize costs, or both.

FDI is expected to be a source of economic growth because it can help to promote growth of host country. Therefore, FDI is a very important and crucial issue for those countries that would like to achieve sustainable economic growth. According to Har et al. (2008), FDI brings in several benefits. The major benefit for a developing country like Malaysia is that FDI played an instrumental role in job creation. When there is much more jobs created in the country, its unemployment will definitely reduce. By creating more job opportunity, FDI can also help countries to improve the development of their country and increase their standard of living. According to Fadli et al. (2011), Malaysia is also one of those developing countries that attract FDI for the purpose of promote growth and development.

According to Ministry of Finance, there are many kinds of policy and strategy, such as tax holidays, tax allowances and export promotions have implemented by the country government in order to maintain the competitiveness and also remain its country as an attractive location for investors. In order to bring in FDI, governments attempt to sustain competitiveness of FDI determinants like legal infrastructure. Moreover, governments have to implement various new policy instruments and strategies to enhance the value of the current determinants in the country to attract FDI.

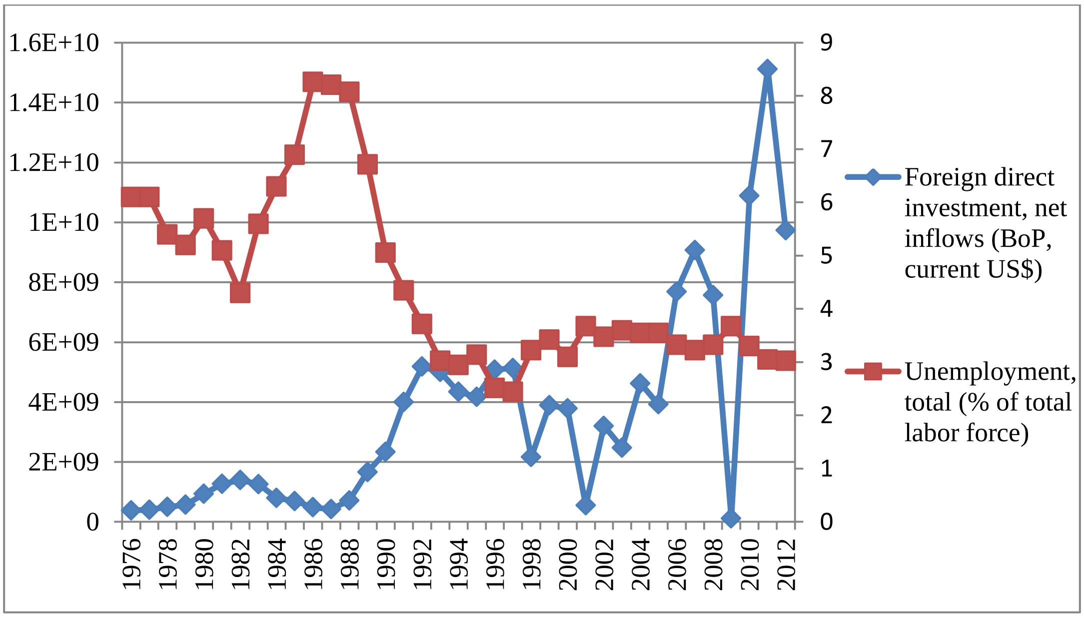
Other than that, there are several factors that may affect a country to be an attractive prospect for FDI. For example, a predictable and non-discriminatory regulatory environment with minimum administrative barriers, like red-tape. A sound macroeconomic environment in which it can provide access to international trade tends to attract more FDI as well. In addition, a country with protracted economic growth and well-functioning of financial system most probably bring in more FDI for that particular country. Availability of necessary and better human capital in a country is very crucial for the purpose of attracting FDI. Furthermore, the level of infrastructure may affect the attraction of FDI, as better infrastructure will facilitate production activities as well as the distribution of output.

Governments of every country around the world are paying much attention on attraction of FDI in order to stimulate economic growth. However, every country has their own and different way to attract FDI. This is most likely because each of the country has dissimilar constraint and culture. Tembe & Xu (2012) also indicated that difference among countries in attraction of FDI is probably because of their geographic location, infrastructure's condition, corruption, taxes and also the policies executed by the governments. Thus, successful policies in certain country should not be duplicated or implemented by any other countries. FDI is merely to be operated conforming to the regional conditions. It must also accord to certain performance requirements so as to make sure that there is a positive impact on development.

1.2 Research Background

FDI is played an importance role in economic growth. According to Shahrudin et al. (2010), among the countries in Asia, Malaysia is one of the countries which are benefited from strong FDI inflow. FDI can be a good contributes for the growth of the industrial sector and transforms Malaysia's economy structure, which is from agriculture to manufacture (Jajri, n.d.). The FDI flow into Malaysia has several benefits, for example, as a capitalization for companies, transfer modern technologies, bring in technical skills and job opportunities (Shahrudin et al., 2010).

Figure 1.2.1 Malaysia's Foreign Direct Investment (FDI), Net Inflow and Unemployment Rate from 1976 to 2012



Source: World Development Indicator, World Bank.

Figure 1.2.1 shows the Malaysia's FDI, net inflow and unemployment rate from 1976 to 2012. The x-axis in the figure shows the time periods in yearly, whereas the left-hand side of the y-axis shows the number of FDI net inflow in Malaysia in terms of United States Dollar (US$) and the right-hand side of the y-axis shows the unemployment rate in terms of percent in Malaysia. The figure 1.2.1 shows significantly that the inverse relationship between FDI inward and unemployment in Malaysia.

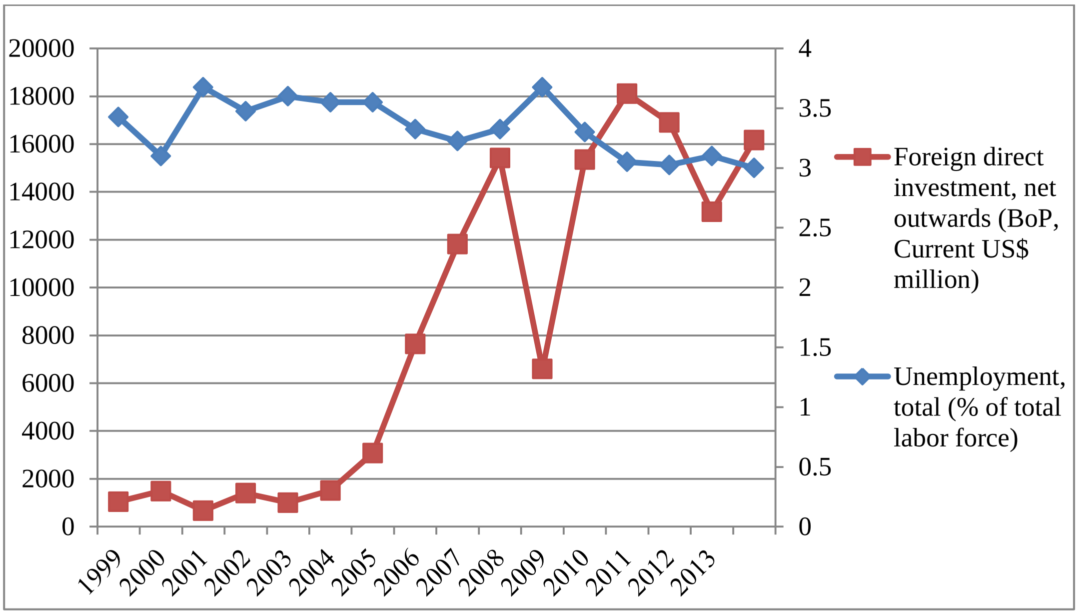
In the figure 1.2.1 has shown the trend rose gradually in FDI inward from 1976 to 1982. Although it is an increasing trend, it stills a low potion of FDI inflow to Malaysia. Throughout the period of 1976 to 1982, it only have about US$ 1 billion or even less of FDI inflow to Malaysia. This is because of the lack of knowledge, unpopularity in Malaysia, and restrictive of the Malaysia's government policies which will make immobility of capital between other countries. While the FDI inward is at the low potion, the unemployment rate is not at the efficient level, which is more than 4%. After that, there is a drop in FDI inward which is from US$ 1.4 billion in 1982 to US$ 0.4 billion in 1987. At the same time, the unemployment rate increase rapidly. In 1982, the unemployment rate is about 4.3% and then rises to about 8.2% in 1987.

In 1990s, the FDI inward is increase rapidly. This is because there are some policy had been introduced by Malaysia government. The government introduced more liberal incentives including allowing a larger percentage of foreign equity ownership in enterprise under the Promotion of Investment Act (PIA), 1986. This policy offered many incentives which include pioneers status tax holidays, expanded investment tax allowances for expansion projects, tax deduction for export promotions, the establishment of Free Trade Zones and other types of incentives to draw FDI (Ministry of Finance, 2001). While the FDI inward increase rapidly, the unemployment rate has decline rapidly, which is from 8.2% in 1987 to 2.9% in 1994. However, there is a drop of FDI inward in 1998, which is from about US$ 5.1 billion in 1997 to about US$ 2.2 billion in 1998. This reduction is due to the Asia financial crisis occur in 1997 and 1998. The reduction of FDI inward has affect the unemployment rate increase to 3.2% in 1998 and continue increase to 3.4% in 1999.

There is a huge drop of FDI inward in 2009. It is drop to the lowest point of the FDI inward of Malaysia. This drop is mainly due to the global financial crisis of 2008 and 2009. In 2008 and 2009, there is an increase for unemployment rate. In 2008, the unemployment rate increase about 0.1% which is become 3.3% and continue increase about 0.3% to become 3.6% in 2009. After that, the FDI inward increase very rapidly in 2010 and 2011 to reach the peak at about US$ 15.1 billion and the unemployment rate decrease to 3% in 2011.

It is well documented in literature that Malaysia has belong to a well-known source of FDI outflow in the region (Bank Negara Malaysia, 2009). The major factors that influences Malaysia become emerging sources of FDI outward is invest in foreign countries can bring more profit opportunities, can be attributed to progressive trade liberalization in the region, the strengthening of the Ringgit Malaysia (RM) against the United States Dollar (US$), and the search for new and expanding markets of major host countries. The Malaysian companies invest aboard can increase their market size and the demand of their products and services. This strategy not only let the company enlarge their market and increase their profit, but it will involve them in internationalizing business activities and become more comparative. Some companies even close the plant in Malaysia and open in foreign country. This is due to the foreign countries have given more comparative advantage to the company compare to Malaysia, for example, labour’s skills, wages, nature resources, and technologies. Besides that, the increase in FDI outflow also due to the Malaysian government’s liberal policy on FDI outflow.

Figure 1.2.2 Malaysia's Foreign Direct Investment (FDI), Net Outflow and Unemployment Rate from 1999 to 2013



Source: UTAR Data Stream.

Figure 1.2.2 shows the Malaysia's FDI, net outflow and unemployment rate from 1999 to 2013. The x-axis in the figure shows the time period in yearly, whereas the left-hand side of the y-axis shows the number of FDI net outflow of Malaysia in terms of United States Dollar (US$) million and the right-hand side of the y-axis shows the unemployment rate in terms of percent in Malaysia. In generally, the figure 1.2.2 shows an inverse relationship between FDI outward and unemployment, but it does not shows a significant effect of FDI outward on unemployment in Malaysia.

The FDI outward of Malaysia shown an increasing trend during 2003 to 2007, which are from US$ 1151 million to US$ 11815 million. While the FDI outward increases, the unemployment rate of Malaysia decreases from 3.69% in 2003 to 3.2% in 2007. There is a nearly 60% drop of FDI outward in 2009, which is from about US$ 1.5 billion in 2008 to about US$ 0.6 billion in 2009. The drop in 2009 is mainly due to the global economic crisis which started in 2008 and continued to 2009 (Saat et al., 2012). When the FDI outward decreases, the unemployment rate increases rapidly from 3.3% in 2008 to 3.7% in 2009. After the financial crisis, the FDI outward bounce to the peak in 2011 which is about US$ 18108 million and the unemployment rate also decrease to 3.1%.

1.3 Problem Statement

The contribution of FDI to unemployment has discussed broadly in the literature over the years. There are many researchers proved this discussion by agreeing that FDI and unemployment indeed have a significant relationship, for example, Mpanju (2012), Shaari et al. (2012) and Zeb & Sharif (2014). In their research, the result showed that the FDI inward has negatively impact on unemployment. In other words, while the foreigner surge more FDI into the country, the unemployment of the country will decrease. This implied that FDI may cure unemployment problem in the country. For a developing country like Malaysia, FDI played a crucial role because it can create more job employment in the country. In addition, FDI can help to develop the country and also improve their standard of living. Therefore, in this research, our focus will be placed on how FDI affects unemployment and their relationship.

Unemployment is a very important issue for every country, especially developing country with a tremendous population. As long as a person is involved in the labour market, he or she may one day become unemployed. High unemployment means that labour resources are not being used efficiently. In consequence, full employment should be a major macroeconomic goal of government. This essential issue has discussed by policymakers, researchers and economists over the several decades. After a long period of discussion and debate, it seems no ultimate solution has found to completely eliminate unemployment. However, we believe that there is an alternative way to reduce the unemployment and maintain it at the efficient level. This is because from the figure on research background, we noticed that FDI inward and FDI outward have an inversely impact on the unemployment in Malaysia. This implied that FDI inward and FDI outward have played an important role in the reduction of unemployment in Malaysia. Since Malaysia is one of the countries that have lowest unemployment rate compared to the other developing country, we may then believe that FDI has contributed to the employment of Malaysia and that is the reason of Malaysia is experiencing low and stable unemployment rate throughout the periods. Hence, this assumption has inspired us to do the research to see the impact of FDI on unemployment in the case of Malaysia.

Furthermore, Malaysia is considered as one of the most outstanding country in attracting FDI among Southeast Asian countries. Malaysia has attracted some big companies from foreign countries, for example Intel Corporation from America, Huawei from China and Lynas Corporation from Australia. These company invested in Malaysia are due to the factors of geographical, resources and exchange rate. Since Malaysia is good in attracting FDI and thus this is an opportunity for Malaysia to maintain the unemployment rate at the efficient level through FDI. While the FDI flow into Malaysia, it will create many job opportunities. This has proven by the case of Lynas Corporation, when the Lynas Corporation plan to move into Malaysia, it has expected to create four hundreds of skilled jobs plus a multiplier effect of five times in secondary jobs through the economic ecosystem. It will also require two hundreds of permanent contract workers and one thousands of indirect workers providing services to its facility. Since this foreign investment has much contributed to the employment of Malaysia, we are greatly motivated to find out the relationship between FDI and unemployment in Malaysia.

1.4 Research Objectives

This research is aimed to find out whether FDI is the panacea for unemployment in the case of Malaysia.

1.4.1 General Objective

The issues and rationales stated in the problem statement has inspired and motivated us to conduct an empirical analysis in an attempt to find out the relationship between the FDI and unemployment, in which how the impact of FDI inward and FDI outward on the unemployment.

1.4.2 Specific Objectives

The main purpose of this research is to find out whether FDI inward or FDI outward has a significant impact on unemployment. Therefore, there are several specific objectives that we would like to investigate in our research:

1. To examine the short run and long run relationship between unemployment, FDI inward and FDI outward.

2. To examine the effect of FDI inward and FDI outward on the unemployment.

3. To investigate various interrelationships between unemployment, FDI inward and FDI outward.

1.5 Research Questions

With the research objectives stated, there are several research questions we have to answer in respect to the problem statement. These research questions serve as guidance for the argumentation in this research:

1. Are there short run and long run relationship between unemployment, FDI inward and FDI outward?

2. What are the impacts of FDI inward and FDI outward on the unemployment?

3. Is there any causal relationship between unemployment, FDI inward and FDI outward?

1.6 Significance of the Study

This research is expected to contribute to two groups of perspectives, which are academia and policymaker.

1.6.1 Academia

The past studies on the nexus of FDI and unemployment are limited and most of the researchers are merely focused on FDI inward in the investigation of relationship between FDI and unemployment, such as Shaari et al. (2012), Mucuk & Demirsel (2013) and Zeb et al. (2014). Nevertheless, they are omitted the important variable which is FDI outward in examining the relationship between FDI and unemployment. Therefore, this empirical research is aimed to bring contribution to the literature by examining the effect of unemployment by both the FDI inward and FDI outward.

1.6.2 Policymaker

This empirical research also aimed to contribute to the policymaker as they will have a better understanding on the impact of FDI on unemployment. The understanding on whether attracting FDI inward or discouraging FDI outward is very crucial to the policymaker in implementing policies. As FDI inward may create more job employment, while FDI outward may tend to increase unemployment. Thus, this research contribute to policymaker by displaying a clear picture regarding the FDI inward and FDI outward in affecting unemployment.

1.7 Chapter Layout

The remaining sections in this research are organized as follow: chapter 2 discussed the existing literature regarding on the relationship between unemployment, FDI inward and FDI outward, followed by chapter 3 which described the data and methodology used in the research. The subsequent chapter explained and interpreted the empirical results. The final chapter emphasized on major findings, policy implications, and limitations and recommendations for future studies.

CHAPTER 2: LITERATURE REVIEW

2.0 Overview

FDI is one of the tools that helped a country to capitalize. In general, most of the economists agreed that FDI can promote employment. In other words, FDI can reduce the unemployment for a country. The unemployment problem will slow down the growth and lead to economic downturn for a country. According to Chang (2005), decrease in unemployment will promote the economic growth. To further discuss this problem, there are several literature studies existed regarding the relationship between FDI and unemployment. This chapter consisted of three sections, which are provided the literature reviews about the relationship between unemployment and FDI inward, followed by the literature reviews regarding the relationship between unemployment and FDI outward, whereas the last part is provided the literature reviews of the relationship between unemployment, FDI inward and FDI outward.

2.1 Unemployment and FDI Inward

There are only some researcher shows the existing of the relationship between FDI inward and unemployment. Palat (2011) use the data on FDI in Japan for the period from 1983 to 2009 to examine statistically the existence of correlation between FDI and unemployment. The result show that there is existence of correlation is evident between FDI and unemployment in Japan.

However, there are some researcher had proven that the FDI inward does not has relationship with unemployment. Brincikova & Darmo (2014) had done the research on the impact of FDI inward on employment from the macroeconomic perspective. The research is use the data for V4 (Czech Republic, Hungary, Poland and Slovakia) countries in period 1993 to 2012. The results show that there is no statistically significant impact of FDI inflow on employment. Rizvi & Nishat (2009) also proven that there is no impact between FDI inward and unemployment. Employment, FDI inward and gross domestic product (GDP) for the countries, which are Pakistan, India and China with the time period of 24 years from 1985 to 2008, is tested. The result from the empirical analysis shows that the FDI inward doesn't have any impact upon the creation of employment in Pakistan, India and China. In other word, there is on relationship between FDI inward and unemployment.

Majority of the researchers found that FDI inward have a negative impact on unemployment in different extent, depending on various factor and countries. Mpanju (2012) has conducted a research to examine the impact of FDI inflow on employment generation and creation in Tanzania. The research is based on the secondary data with the period from 1990 to 2008 by using the ordinary least squares method. In the research, the empirical analysis shows that there is a positive relationship between FDI inflow and employment. This also means that there is a negative relationship between FDI inflow and unemployment rate. According to Shaari et al. (2012), FDI inflow also has a negative relationship with unemployment rate. The paper of Shaari et al. (2012) is aim to analyze the impact of FDI inflow on the unemployment rate and economic growth in Malaysia by using the empirical analysis. The Simple Ordinary Least Square regression is used to test the impact of FDI inflow on the unemployment rate and economic growth in Malaysia from year 1980 to 2010. The result show that increase 1% of FDI inflow can lead to the unemployment rate to decrease 0.009% and real GDP to increase 1.219% in Malaysia. Ciurila (n.d.) has test the relationship between FDI inflow, the real exchange rate, the unemployment rate, labour productivity and the average wealth tax rate for the six Central and East European countries: Bulgaria, Czech, Hungary, Poland, Republic, Romania and Slovakia. The research is using quarterly data which is from the period 1997 Q1 to 2007 Q1 with Vector Error Correction model (VECM). This research found that there is a statistically significant negative relationship between FDI inflow and unemployment rate. Zeb & Sharif (2014) has done a research which aims to explore the impact of FDI inward and unemployment in Pakistan. In this research also include other variables, which are corruption, population size and inflation. The research using time series data of 17 years which is from 1995 to 2011.The research has a small period of sample size because there is unavailability of data. Ordinary Least Square (OLS) technique is used and the result shows that FDI inward is significant in reducing unemployment in Pakistan. The inflow of FDI can create more employment opportunities, hence resulting in reduction of unemployment rate in the countries. Ciftcioglu et al. (n.d.) use theoretical expectations has shown that the FDI inward adversely impact on unemployment over the period from 1995 to 2003.

On the other hand, there are some researcher found that there are a positive relationship between FDI inward and unemployment rate. Hisarciklar et al. (n.d.) is examined the impact of FDI inward on employment in Turkey. This paper is using panel data analysis on 19 sectors for the period of 2000 to 2007 with the system Generalized Method of Moments (GMM). The result shows that there is a negative impact of FDI inward on employment level. In other word, FDI inward has a positive relationship with the unemployment. Bailey & Driffield (2007) found that the FDI inward will reduces the demand for the unskilled workers with the data period from 1980 to 1996 for United Kingdom (UK). The demand of the unskilled labour decrease will lead to the decrease of employment and increase of unemployment. Therefore, the result shows that the FDI inward will decrease the unemployment in UK. Wang et al. (2013) are using a panel database compiled from four major sources on 287 Chinese cities over the period of 1999 to 2005 to examine the multi impact of FDI inward. The FDI inflow has an impact on unemployment and the environment from the international business research. The result shows that the FDI inward have negative impact on the employment and the environment for the host city by using the city-level panel data. This also means that the FDI inward is positively related to unemployment.

There are some research produce the mixed results on the impact of FDI inward on unemployment rate. Balcerzak & Zurek (2011), who had done the research on the proven of the interdependency between FDI inward and unemployment rate by using aggregate data and Vector Autoregressive Modeling (VAR) methodology. The investigation is based on the period from year 1995 to 2009 for Poland. the result from the impulse response function show when FDI inflow increase, the decrease of unemployment rate and then slowly growth to initial state of this rate takes a place. According to Balcerzak & Zurek (2011), the FDI have potential to deteriorate the unemployment in short run but the government implement policies to attract the FDI which would result in positive long term results of foreign capital inflow. It will bring positive result for labour market. Hua (n.d.) selected the sample period from 1995 to 2009 to test the FDI's employment effect in Jiangxi. The results show that the relationship between FDI inward and employment in primary industry, secondary industry and tertiary industry are negative, positive and positive respectively. In other words, the FDI inward have a positive impact on unemployment in primary industry and a negative impact for the secondary and tertiary industries. Mucuk & Demirsel (2013) is determine the impact of FDI inward on employment for the seven developing countries, which are Argentina, Chile, Colombia, Philippines, Thailand, Turkey and Uruguay by panel data technique for the period of 1981 to 2009. The results show that Argentina Thailand and Turkey indicated there are co-integrated in the long run between FDI inward and unemployment. Argentina and Turkey show a positive relationship between FDI inward and unemployment, but Thailand shows the negative relationship. The result from the causality test indicate that that there is only a causal relationship from FDI to unemployment in the long run even though there is no relationship between the variables in the short run. However, Chile, Colombia, Philippines and Uruguay show that there is no relationship between FDI inward and unemployment.

2.2 Unemployment and FDI Outward

There are some researcher tests the relationship between FDI outward and unemployment. Chen & Zukifli (2012) are using the logarithm of Gross Domestic Product (GDP), FDI outward, domestic investment and labour for the period from year 1980 to 2010 to investigate the association between FDI outward and economic growth in Malaysia. The result from the Granger-causality test shows that there is a long-run causality from GDP, domestic investment, and employment to FDI outward in Malaysia. This shows that the FDI outward has a long-run relationship with the unemployment.

Chen (2011) are using Computable General Equilibrium (CGE) model to examine the effect of FDI outward on the domestic economy in Taiwan. The result show that when FDI outward increase by 100%, the simulation reveals that the GDP and gross national product (GNP) are reduce by 1.43% and 0.51% respectively, but the unemployment level will increases by 4.98%.

Lin & Wang (n.d.) are study the correlation between FDI outward and unemployment by using the empirical evidence of G-7 (Canada, France, Germany, Italy, Japan, United Kingdom and United States) countries for the periods of 1981 to 2002. In the result, they found that it has a mixed result. Based on their findings, there is a negative relationship between FDI outward and unemployment in all the countries excluded United States. United States case gave a different result, which is the FDI outward positively correlated to unemployment rate.

2.3 Unemployment, FDI Inward and FDI Outward

There are less researcher are examine the interrelationship on the unemployment, FDI inward and FDI outward. Chang (2005) used the VAR method of decomposition and impulse response function analysis to analyze the interrelationship between FDI, exports, unemployment and GDP for Taiwan over 1981Q1 to 2003Q3. The result show that there is the FDI inward and outward has positive relationship on unemployment in Taiwan. It is shows a positive relationship, but the impact is not so obvious. The results show no significant effect from unemployment to FDI outward and barely significant from unemployment to FDI inward. The FDI inward does not have significant effect on FDI outward, but the FDI outward positively significant to FDI inward.

CHAPTER 3: METHODOLOGY

3.0 Overview

In this chapter, we discussed the methodology that we have used to execute our research. At first, we defined the variables that we used in our research. After that, Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) of unit root tests are carried out to determine the stationary of the variables in the regression model. Moreover, Kwiatkowski-Phillips-Schmidt-Shin (KPSS) is used in our research to ensure that the results from ADF and PP tests are correct. In order to test the relationship between unemployment, FDI inward and FDI outward in Malaysia, we are applied Vector Autoregressive (VAR) model. Before that, we performed diagnostic checking in our research by using stability condition, normality test and Breusch-Godfrey serial correlation LM test. It is important to make sure that model in our research is "dynamic" stable when employing VAR model. Lastly, Granger causality test is applied in this research to test the direction of the causality between the variables and then followed by the impulse response function and variance decomposition.

3.1 Data Description

The data we used in this research is obtained from only one source, which is data stream in UTAR library. We used quantitative method with a total of 60 sample size in our research. The data periods in this research is started from the first quarter (Q1) of 1999 to the fourth quarter (Q4) of 2013. We chose quarterly data as the same proposed to use quarterly data in our employed methodology (Balcerzak & Zurek, 2011). In fact, there are few advantages of using quarterly data. One of the advantages is quarterly data allows for important intra-year dynamics as the unemployment rate will change along the year. Hence, quarterly data will be better in capturing the rich dynamic pattern of decision making process compared to the yearly data. Moreover, yearly data will always cause the result be more complicated, as well as more difficult in interpretation of the results. Other than that, quarterly data are also helping in the increase in sample size and ease up the problem of decreasing degree of freedom. In this research, our data used are all logarithmically transformed. The reason that we logarithm the data is because we want to ensure that the data are in linear form. Besides that, we want to ensure that the variables are normally distributed. This shows that applied logarithm form to the data can renovated symmetric of the data. Last but not least, data transformation is also to guarantee that the data have constant variance.

There are three variables which are unemployment, FDI inward and FDI outward has included in our regression model. In general, unemployment rate can be define as the percentage of the total labour force who are over the age of 16 that is unemployed, but they are still willing to work and try their best in seeking for job. People who are jobless and do not active in seeking job are not included in labour force, thus these people will not counted in unemployment rate. Unemployment is one of the components that will affect the economic growth of the country. The economic theory of Okun's Law empirically describes this relationship between unemployment and gross domestic product (GDP). Okun's Law shows that every 1% increase in a country's unemployment rate, the national GDP will suffer about 2% loss in potential. In the view of economists, unemployment happened when people are able to work, but they are unable to get a job. In consequence, it will reduce the production and also human capital of a country. Unemployment will be more serious when recession because demand for the labour will decrease hugely during economic downturn. Hence, supply of labour is much more than demand for the labour. If unemployment does not cure immediately, it will affect a person's job prospects by damaging the human capital. In Malaysia case, population grows faster than employment opportunities, therefore unemployment occurred.

Unemployment can be differentiated into four different types, which are frictional unemployment, structural unemployment, cyclical unemployment and seasonal unemployment. Frictional unemployment is less problematic than other types of unemployment. It can be define as a person quit the job, but he or she does not get the new job immediately. During this period, he or she will count in the frictional unemployment. Frictional unemployment occurred is mainly due to people are too concerned about the wages, locations of the job, working hours, personality and also the skills of labour. It is not specifically problematic in the stand of economy because it only happens in short period. Secondly, structural unemployment happened mainly because of the mismatch of workers' skill and the employers' needs. In other words, it is inefficient in labour market. Structural unemployment may be an issue that economist concerns. It mainly because of structural unemployment may tend to take a long period and the retaining workers are not a cheap or easy task for the firms. When structural unemployment rate is high, it may cause the productivity of the country reduce and then slow down the economy. Next, cyclical unemployment happened during recession and depression. When recession occurred, the demand for the goods and services may fall and it will cause the firms to reduce the production. While the production decrease, firms will choose to downsizing by reduce the employment rather than reduce the labour's wages to minimize the cost of production. Therefore, cyclical unemployment happened. However, it may not sustain longer. This is because cyclical unemployment will not exist when the economy of the country out from the recession. Lastly, seasonal unemployment is less serious than structural unemployment. However, seasonal unemployment can be considered as structural unemployment, but it is only happened in the certain period of the year. Seasonal unemployment is more predictable and it is consider as part of the “conditions of employment”.

Next, FDI can be defined as the direct investment which the companies are from other country or business which carry out in a country by the individual. FDI is one of the components that will contribute to the economic growth of the host country. Besides that, FDI can be investors who are abroad buying the company or factory in the targeted country to start the business or expand the operation of the business. As so, FDI has the intention to merge and acquisition, building new facilities in the country and also it helps to reinvest profits earned from overseas operations and intra company loans. It normally involves the participant of the expertise from other country, transfer of the technology especially form the high-end country to the low-end country and also joint venture. FDI is stated in the national account that will affect the GDP of the existing country. FDI is a category of cross-border investment associated with a resident in one economy having control or a significant degree of influence on the management of an enterprise that is resident in another economy. It acts as an important role for boosting the economic growth of the country especially for developing country. Besides that, it also helps to solve economic problem.

There are two types of FDI, which are FDI inward and FDI outward. For host country, FDI inward not only transfers the new technology, but also create jobs for the host country. It includes all liabilities and assets transferred between resident and non-resident and direct investment enterprises and their direct investors. It also covers transfers of assets and liabilities between resident and non-resident fellow enterprises, if the ultimate controlling parent is non-resident. Other than this, it also brings innovation in operational practices to the country and therefore it may help to increase the productivity of the host country. It helps in creating jobs and boosts the economy. At last, they enhance their employees' lifestyles, helping to create a better standard of living for the recipient country.

FDI outward is kind of investment which is conducted abroad. It includes assets and liabilities transferred between resident and non-resident and investor and their direct investment enterprises. Employing outward direct investment is a natural progression for firms as a better business opportunity will be available in foreign countries when domestic markets become too saturated. While the rising levels of outward FDI from developed countries have raised concerns regarding its impact on their domestic investment, little or no attention has been paid to such effects in developing and transition economies. Policymakers in these countries need to assess how domestic investment is affected by FDI outflows; domestic investment determines the rate at which physical capital is accumulated, which subsequently determines the rate of economic growth. Understanding the impact of FDI outflow on domestic investment may therefore be a vital step toward introducing market reforms that can boost domestic investment and enhance growth.

3.2 Unit Root Tests

Unit root test is used to test whether a time series variable is non-stationary or stationary, as well as to determine the number of integrated orders for the variables of unemployment, FDI inward and FDI outward individually. If they are having a long run relationship, these variables will then follow the same integrated order.

The unit root test was firstly developed by Dickey and Fuller (1979). Unit root test assumed that the first difference in the series is serially uncorrelated in the unit root null hypothesis. However, this model will lead to the autocorrelation problem because it does not consider the dynamic effect of time series data. Due to the limitation of Dickey-Fuller (DF) test, the researcher further developed the test, which is ADF test (1981).

ADF test is the value which used in the test is a negative number. The more negative it is, the greater the possibility of rejecting the null hypothesis where is a unit root at some level of confidence. Besides that, it relies on parametric transformation of the model that removes the serial correlation in the error term, leaving the asymptotic distributions of the various τ statistics.

PP test statistics can be viewed as DF test statistics, which is being used in time series analysis to test the null hypothesis that the series is an integrated of order 1. The PP test is different from ADF test, as ADF test relies on a parametric transformation, while PP test proposes a non-parametric transformations of the τ statistics from the original DF regressions, where the transformed statistics have DF distributions when under the unit root null. Other than that, PP tests have made robust to serial correlation by using the Newey–West (1987) heteroscedascity and autocorrelation-consistent covariance matrix estimator.

On the other hand, Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test is intended to complement unit root tests, such as the DF, ADF and PP tests. By testing both the unit root hypothesis and the stationary hypothesis, one can distinguish series that appear to be stationary, series that appear to have a unit root, and series for which the data are not sufficiency informative to be sure whether they are stationary or integrated.

A variety of alternative procedures have been proposed that try to resolve these problems, particularly the power problem, but the unit root tests of ADF and PP are widely used. If the process is stationary, but a root is close to the non-stationary boundary, then the result of the test may not accurate. This is even obvious when the sample size is small, it will be harder to determine the root properly. Behind of this reason, KPSS test is proposed to find out whether the model has a deterministic trend or stochastic trend. Hence, we able to compared whether the result from the ADF or PP test is the same conclusion.

3.3 Diagnostic Checking

3.3.1 Stability Condition

Before estimate our VAR model, there is a very important step that we have to do is to make sure that our model is 'dynamic' stable to check the stability condition. One of the methods to determine the stationary is by viewing on the characteristic equations that we have formed. First of all, we may like to make it in simple equation, AR(1): -

$$Y_t = \beta_1 Y_{t-1} + \varepsilon_t \qquad \text{……………………..…………………………… (10)}$$

Equation (10) is an equation that so call differences equation because it includes many variables at different time. After this, we may express equation (10) into the lag operator L, which we will get:

$$Y_t = \beta_1 L Y_t + \varepsilon_t \qquad \text{……………………………………….……….…… (11)}$$

$(1 - \beta_1 L)\, Y_t = \varepsilon_t$ …………………………..…………………… (12)

For the purpose of finding characteristic root in equation (11) and (12), a variable is take place by the lag operator L. After that, we abolish the Y_t and set it as the ε_t = 0:-

$(1 - \beta L) = 0$ ……………………………...…...…………… (13)

$(1 - \beta Z) = 0$ ……………………………..………………… (14)

$|Z| = \frac{1}{\beta}$ …………………………………………..…… (15)

Finally, we solve the stability condition by the value of Z which is stated as the characteristic roots. When all of the roots are lie outside the unit circle then the Y_t is stationary. This fact are refer to at least one of the root is complex numbers. If the roots all are real numbers which mean that none of them are complex numbers, then we can said that Y_t is stationary when the absolute values of the real roots are greater than one.

3.3.2 Normality Test

Normality test (Jarque-Bera test) is conducted in our research to determine whether the error terms are normally distributed. Normality test is the first requirement for any of the statistic tests, for example the two way ANOVA, which pre-requisite a normally distribution of sample population before proceed to other statistic test. If there is not valid in the assumption of normality, then the results of the test that carried out can consider unreliable.

3.3.3 Breusch-Godfrey Serial Correlation LM Test

The purpose of using Breusch-Godfrey serial correlation LM test is for testing the problems of autocorrelation in the regression model. The null hypothesis of the Breusch-Godfey serial correlation LM test is that there is no serial correlation up to any numbers of lag. Compared with Durbin-Watson statistic, this test will be more popular which it only valid non-stochastic regressors. Other than this, Breusch-Godfrey serial correlations LM test also testing for the feasibility of a first- order autoregressive model for the regression errors.

3.4 Vector Autoregressive (VAR) Model

VAR model is an extension of autoregressive (AR) model by adding multiple variables. It is a model which disseminate by Sims (1980), who has help to solve major problems that faced in economic area.

The VAR model is in a sense a systems regression model which means there is more than one dependent variable or so call multivariate model. In other words, the VAR model is n-equation, n-variable linear model in which each variable is explained by its own lagged values, and current and lagged values of n-1 variables. According to Sims (1980), if there is true simultaneity among a set of variables, there should be no any priori distinction between endogenous and exogenous variables and hence the variables should be treated equally. Generally, this model is able to complete four tasks at once, which are describe and summarize microeconomic data, forecasting the macroeconomic factors, analyse the policy and quantify the structure of the macroeconomic. The VAR model has proven to perform better, hence more reliable tools in the sense of forecasting and data description. Meanwhile, for structural inference and policy analysis, they are more on "depends" as they require differentiating between correlation and causality, which is the identification problem in terms of econometrics. However, this problem can be solved by mostly economic theory or institutional knowledge.

There are few researchers using VAR technique to study the effect of FDI toward unemployment. Chang (2005), and Balcerzak and Zurek (2011) are examine the impact of FDI towards unemployment.

The benchmark model specification and estimation:

In our research, we have involved three variables in the VAR model. To make it simple, we consider the lag length 1, thus the equations will be carried as follow: -

$LUE_t = \alpha_{10} - \alpha_{12} LFDI\_I_t - \alpha_{13} LFDI\_O_t + \beta_{11} LUE_{t-1} + \beta_{12} LFDI\_I_{t-1} + \beta_{13} LFDI\_O_{t-1} + \varepsilon_{1t}$.....(1)

$LFDI\_I_t = \alpha_{20} - \alpha_{21} LUE_t - \alpha_{23} LFDI\_O_t + \beta_{21} LUE_{t-1} + \beta_{22} LFDI\_I_{t-1} + \beta_{23} LFDI\_O_{t-1} + \varepsilon_{2t}$.....(2)

$LFDI\_O_t = \alpha_{30} - \alpha_{31}LUE_t - \alpha_{33}LFDI\_I_t + \beta_{31}LUE_{t-1} + \beta_{32}LFDI\_I_{t-1} + \beta_{33}LFDI\_O_{t-1} + \varepsilon_{3t}$.....(3)

or in vector form, it will be : -

$$\begin{pmatrix} 1 & 0 & 0 \\ X & 1 & 0 \\ X & X & 1 \end{pmatrix} \begin{pmatrix} LUE_t \\ LFDI\_I_t \\ LFDI\_O_t \end{pmatrix} \begin{matrix} = \\ = \\ = \end{matrix} \begin{pmatrix} \alpha_{10} \\ \alpha_{20} \\ \alpha_{30} \end{pmatrix} + \begin{pmatrix} \beta_{11} & \beta_{12} & \beta_{13} \\ \beta_{21} & \beta_{22} & \beta_{23} \\ \beta_{31} & \beta_{32} & \beta_{33} \end{pmatrix} \begin{pmatrix} LUE_{t-1} \\ LFDI\_I_{t-1} \\ LFDI\_O_{t-1} \end{pmatrix} + \begin{pmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \end{pmatrix}$$

where LUE_t = logarithmic unemployment rate, $LFDI\_I_t$ = logarithmic foreign direct investment inward, and $LFDI\_O_t$= logarithmic foreign direct investment outward. The structural shocks,ε_{1t}, ε_{2t}, and $\varepsilon_{3t}$are unobservable IID zero mean error terms and zero covariance. The error term is correlated over the equations only. Every variable in VAR model are consider endogenous variable, in which these variables are depending on the lagged values of it and other variables too.

By using recursive VAR, we obtain zero restriction on some of the parameters in the matrix form which are α_{12}, α_{13} and α_{23}. Since we apply zero restrictions, therefore we can say that LUE_t is not affected by other variables in equation (1). At the same time, it means that $LFDI\_I_t$ and $LFDI\_O_t$ do not simultaneously affect LUE_t . In equation (2), LUE_t and $LFDI\_I_t$ have contemporaneous affect on $LFDI\_O_t$. Lastly, in equation (3), $LFDI\_O_t$ is affected by the structural shocks of LUE_t and $LFDI\_I_t$.

The simplify of the structural VAR in vector form: -

$$ZY_t = \rho_0 + \rho_1 Y_{t-1} + \varepsilon_t \qquad \text{.......................................} \quad (7)$$

Equation (7) is the structural VAR, which is also known as Primitive System. In this equation, we multiply it with the inverse Z. The reason of multiply with inverse Z is to normalize the right-hand side vector.

$$Y_t = Z^{-1}\ \rho_0 + Z^{-1}\ \rho_1\ Y_{t-1} + Z^{-1}\varepsilon_t \qquad \text{..............................} \quad (8)$$

$$Y_t = \gamma_0 + \gamma_1\ Y_{t-1} + \Phi_t \qquad \text{..} \quad (9)$$

In equation (9), it is stated as a VAR in standard form or reduced-form VAR where Y_t is indicate as the vector of endogenous variables, that is Y_t (LUE_t, $LFDI\_I_t$, $LFDI\_O_t$) is a three dimension vector in the logarithms. Φ_t = (Φ_{1t}, Φ_{2t}, Φ_{3t}) is the vector of reduced-form residuals when the reduced-form VAR is in matrix form: -

$$\begin{pmatrix} LUE_t \\ LFDI\_I_t \\ LFDI\_O_t \end{pmatrix} \begin{matrix} = \\ = \\ = \end{matrix} \begin{pmatrix} \lambda_{10} \\ \lambda_{20} \\ \lambda_{30} \end{pmatrix} + \begin{pmatrix} \lambda_{11} & \lambda_{12} & \lambda_{13} \\ \lambda_{21} & \lambda_{22} & \lambda_{23} \\ \lambda_{31} & \lambda_{32} & \lambda_{33} \end{pmatrix} \begin{pmatrix} LUE_{t-1} \\ LFDI\_I_{t-1} \\ LFDI\_O_{t-1} \end{pmatrix} + \begin{pmatrix} \Phi_{1t} \\ \Phi_{2t} \\ \Phi_{3t} \end{pmatrix}$$

3.5 Granger Causality Test, Impulse Response Function and Forecast Error Variance Decomposition

One of the usages of VAR model is to forecast, which is what economists usually do. As the structure of VAR model provides information about the joint generation process of one variable to another variable, we may use them to investigate the relationship between the variables. This specific type of relation is known as Granger causality, which is found out by Granger (1969). It is said that when a variable, or group of variables, Y_1 is helpful on forecasting another variable or group of variables, Y_2, and then Y_1 can be said to granger cause Y_2; otherwise it does not granger cause Y_2 if it is found useless on forecasting the other variable. This means that if the information in past and present values of Y_1 may influence on forecast of Y_2, then it can be concluded that Y_1 granger cause Y_2. Granger causality test can be tested out by using F-test or Standard Wald X^2 to find out the significance of the lags on the explanatory variables. Besides that, Granger causality test can be used to test out whether a variable is exogenous. For example, it is known as exogenous if there is no variables in a model affect a particular variable. The null hypothesis test for Granger causality is that Y does not granger causes X.

Though Granger causality test is used to test out the relationship between the variables, it may not give us the complete story about the interactions between them. To find this relationship in a higher dimensional system, we may find out by the impulse response function. The impulse response functions can be used to produce the time path of the dependent variables in the VAR, to shock from all the explanatory variables. An unstable system would produce an explosive time path. Impulses are usually treated as exogenous from a macroeconomic point of view including the changes in productivity or other technological, while the impulse reaction functions explain the reaction of endogenous macroeconomic variables, for example consumption, output, investment and employment.

Other than that, there is still another tool to investigate the impact of shocks in VAR models, which is the forecast error variance decomposition. This tool can investigate in a series of time horizons, how much of the forecast error variance for any variable in a system, is explained by innovations to each explanatory variable. Furthermore, it able to determine which variables in the model has the short term or long term impact on another variable of interest, thus it able to obtain information about the relative significance of each random innovation in affecting the variables in the estimated model. Furthermore, it is also important to determine the ordering of the variables when conducting these tests, as the error terms of the equations in VAR will be correlated, thus the result will be dependent on the order in which the equations are estimated in the model.

CHAPTER 4: RESULTS AND INTERPRETATION

4.0 Overview

In this chapter, we reported the findings of our research. We employed VAR model to examine the nexus between unemployment, FDI inward and FDI outward in Malaysia based on the observation from 1999 until 2013. The results are being reported and interpreted in this section. Unit root test is performed by using Augmented Dickey-Fuller (ADF), Philips-Perron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests to examine the stationary of the variables. After that, we carried out lag length selection. We also performed diagnostic checking by checking the stability condition on the variables as well as normality test to examine whether the error terms are normally distributed. Besides that, we applied Breusch-Godfrey serial correlation LM test to make sure our data is free from autocorrelation problem. Last but not least, our findings are interpreted through Granger causality test, impulse response function and variance decomposition.

4.1 Unit Root Tests

The results of the ADF, PP and KPSS tests for unit root on level is shown in table 4.1.1, table 4.1.2 and table 4.1.3 respectively. KPSS test is conducted to confirm the results of the ADF and PP tests.

Table 4.1.1 Augmented Dickey-Fuller (ADF) Test

Variables	Stat. intercept and no trend	Stat. intercept with trend
Level		
LUE	-5.498893***	-5.229950***
LFDI_I	-6.215854***	-6.872915***
LFDI_O	-4.065454***	-5.724342***

Note: *, **, *** denotes significance level at 10%, 5%, and 1% respectively.

Table 4.1.2 Philips-Perron (PP) Test

Variables	Stat. intercept and no trend	Stat. intercept with trend
Level		
LUE	-5.545347***	-5.742520***
LFDI_I	-6.516281***	-6.975491***
LFDI_O	-4.065454***	-5.600181***

Note: *, **, *** denotes significance level at 10%, 5%, and 1% respectively.

Table 4.1.3 Kwiatkowski-Phillips-Schmidt-Shin (KPSS) Test

Variables	Stat. intercept and no trend	Stat. intercept with trend
Level		
LUE	0.471770*	0.128558*
LFDI_I	0.408445*	0.047534***
LFDI_O	0.841956	0.104638***

Note: *, **, *** denotes significance level at 10%, 5%, and 1% respectively.

Based on these three tables, we can conclude that all series are stationary at level form and significant at significance level of 10%, 5% and 1%. Thus, we proceed to the variables in level form.

4.2 Lag Length Selection

In our study model, we determined the number of lag length follow the lag length selection criteria, which are sequential modified LR test statistic (LR), Final prediction error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC), and Hannan-Quinn Information Criterion (HQ). Based on the lag length selection criteria, we tend to choose the lag length which suggested by most of the criteria.

Table 4.2.1 Lag Length Selection

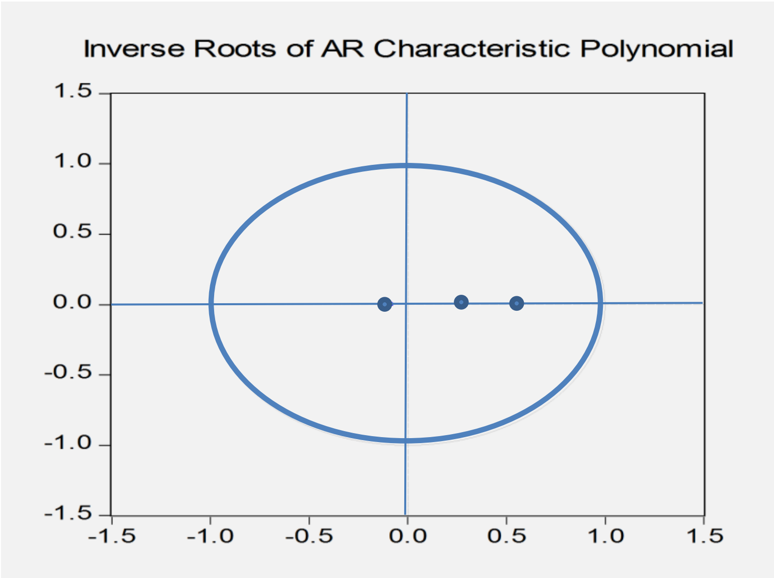
Lag	LogL	LR	FPE	AIC	SIC	HQ
0	-47.98464	NA	0.001282	1.853987	1.963478	1.896328
1	-28.93821	35.32247	0.000890*	1.488662*	1.926626*	1.658026*
2	-22.99465	10.37421	0.000998	1.599805	2.366242	1.896193
3	-12.09725	17.83211*	0.000939	1.530809	2.625718	1.954219
4	-3.366398	13.33439	0.000963	1.540596	2.963978	2.091030
5	3.534677	9.786980	0.001065	1.616921	3.368775	2.294377

Based on the table 4.2.1, there are four out of five criteria suggested lag length 1 which are FPE, AIC, SIC, and HQ criteria. Therefore, we chose to use lag length 1 in our study model.

4.3 Diagnostic Checking

4.3.1 Stability Condition

Figure 4.3.1.1 Stability Condition of Model

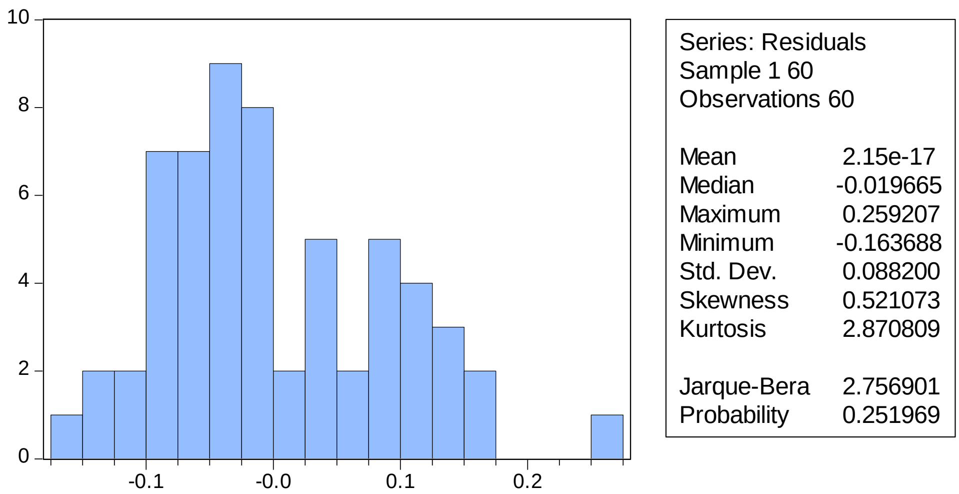


Based on the figure 4.3.1.1, it shows that our study model is dynamic stable as the inverse characteristic roots are all below one.

4.3.2 Normality Test

We need to examine whether the error terms are normally distributed. If the error terms are normally distributed, so the specification model is correct and vice versa. In order to determine whether the error terms are normally distributed, we conducted the Jarque-Bera test. Error terms are normally distributed is stated as the null hypothesis. The decision rule would be reject null hypothesis if P-value less than significance level of 10%, 5% and 1%, otherwise do not reject it.

Figure 4.3.2.1 Normality of Residuals (Jarque-Bera Test)



Based on the figure 4.3.2.1, the P-value (0.251969) is more than 0.10, 0.05 and 0.01, therefore we do not reject null hypothesis. Hence, we concluded that the error terms in the model are normally distributed at significance level of 10%, 5% and 1%.

4.3.3 Breusch-Godfrey Serial Correlation LM Test

We have to conduct hypothesis testing in order to detect whether there is autocorrelation problem exists in our estimated model by using Breush-Godfrey serial correlation LM test. The null hypothesis is stated that there is no autocorrelation problem in the model. We can decide whether to reject null hypothesis by comparing P-value with significance level. If the P-value is less than the significance level of 10%, 5% and 1%, we have to reject the null hypothesis. Otherwise, we do not reject the null hypothesis.

Table 4.3.3.1 Breusch-Godfrey Serial Correlation LM Test

Lags	LM-Stat	Prob.
1	12.98219	0.1634
2	4.896296	0.8433
3	22.25702	0.0081
4	12.26310	0.1989
5	11.44416	0.2465
6	4.972182	0.8367

From the table 4.3.3.1, the serial correlation LM test shows that our study model has no autocorrelation problem. As mentioned earlier, we take lag length 1 for the model; the P-value of LM test is 0.1634, which is greater than 0.10, 0.05 and 0.01. Hence, we do not reject null hypothesis and thereby we shall concluded that our study model is free from autocorrelation problem at significance level of 10%, 5% and 1%.

4.4 Vector Autoregressive (VAR) Model

4.4.1 VAR Estimates

LUEt	= 1.601264	- 6.845276LFDI _It	- 2.498989LFDI_Ot	+ 0.210246LUEt-1	+-0.045864LFDI_It-1	+-0.027380LFDI_Ot-1
	***	***	***	***		
LFDI_It	= 6.845276	- 1.601264LUEt	- 2.498989LFDI_Ot	+ -0.309391LUEt-1	+0.035461LFDI_It-1	+0.243189LFDI_Ot-1
	***	***	***			***
LFDI_Ot	= 2.498989	- 1.601264LUEt	- 6.845276LFDI _It	+ 0.305262LUEt-1	+0.169262LFDI_It-1	+ 0.508661LFDI_Ot-1
	***	***	***		***	***

Note: *, **, *** denotes significance level at 10%, 5%, and 1% respectively.

4.4.2 Granger Causality Test

For the Granger causality test, the null hypothesis is stated as there is no granger causality. The decision rule is to reject the null hypothesis when the P-value is less than 10%, 5% and 1% significance level. Otherwise, we do not reject the null hypothesis. Meanwhile, we can conclude that there is granger causality between the variables.

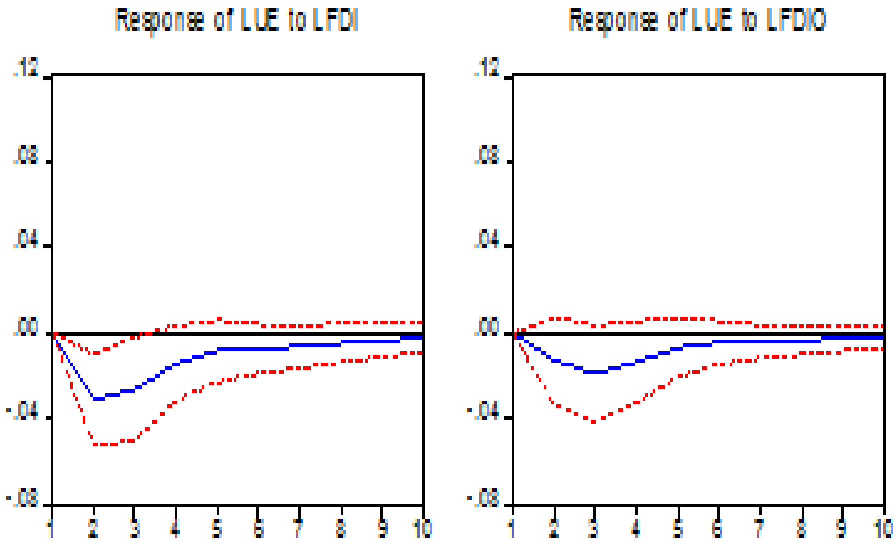
Table 4.4.2.1 Granger Causality Test

Null Hypothesis	Chi-sq	d.f.	Prob.
LFDI_I not granger cause LUE	6.497523	1	0.0108
LFDI_O not granger cause LUE	3.021086	1	0.0822
LUE not granger cause LFDI_I	0.116475	1	0.7329
LUE not ganger cause LFDI_O	0.105252	1	0.7456
LFDI_I not granger cause LFDI_O	1.260941	1	0.2615
LFDI_O not granger cause LFDI_I	3.658260	1	0.0558

From table 4.4.2.1, we can see that LFDI_I does Granger cause LUE at 5% and 10% significance levels that is its P-value, 0.0108 is lower than 0.05 and 0.10. Meanwhile, we also found that LFDI_O does Granger cause LUE at least at 10% significance level (0.0822 is less than 0.10). However, we found that LUE does not Granger causes both LFDI_I and LFDI_O as their P-values, 0.7329 and 0.7456 respectively are failed to reject null hypothesis at any significance level. Besides that, LFDI_I does not Granger causes LFDI_O as P-value 0.2615 is greater than all significance levels. Nevertheless, LFDI_O does Granger causes LFDI_I at 10% significance level because its P-value 0.0558 is lower than 0.10.

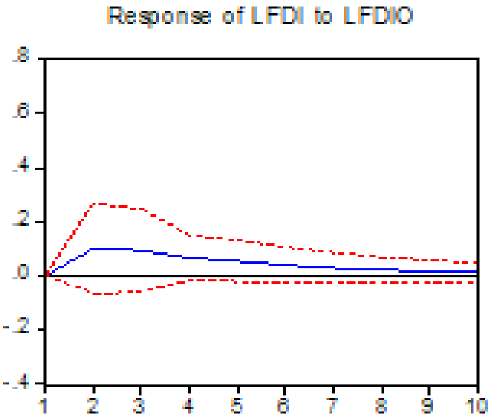
4.4.3 Impulse Response Function

Figure 4.4.3.1 Impulse Response of LUE to LFDI_I and LFDI_O



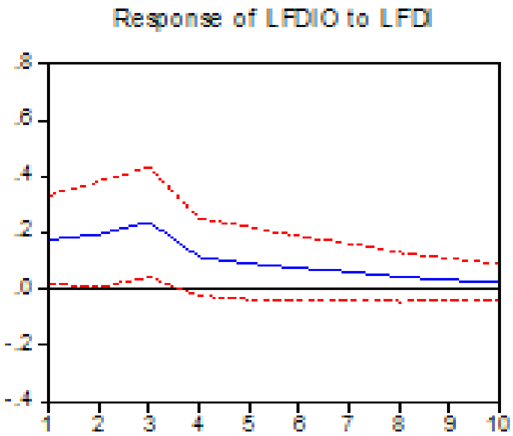
The figure 4.4.3.1 shows the impact of LFDI_I to LUE and LFDI_O to LUE. Based on the left figure, we can see that the LFDI_I causing LUE to decrease significantly in the first two quarter. Starting third quarter, the decreasing rate started to diminish. In short, LFDI_I causing LUE to decrease, but the effect diminishes throughout the periods. Meanwhile, from the figure at right-hand side, we can see that the effect of LFDI_O towards LUE is almost the same, but the impact is not as strong as LFDI_I. Though lesser impact, we still can see that LFDI_O causing LUE to decrease initially. While entering into the third quarter, the effect started to diminish across periods. In conclusion, we can actually see that the pattern of impulse response of LUE to both LFDI_I and LFDI_O is almost similar.

Figure 4.4.3.2 Impulse Response of LFDI_I to LFDI_O



Based on the figure 4.4.3.2, it shows the impact of LFDI_O to LFDI_I. In the figure, we can see that the LFDI_O causing LFDI_I in increasing rate in the first two quarter. From third quarter onwards, it started to diminish throughout the periods.

Figure 4.4.3.3 Impulse Response of LFDI_O to LFDI_I



Based on the figure 4.4.3.3, it shows the impact of LFDI_I to LFDI_O. In this figure, we can see that there is an increasing rate on the first three quarter. However, it is decreasing dramatically to quarter four. After that, it is decreases slightly from quarter four to quarter ten.

4.4.4 Variance Decomposition

Table 4.4.4.1 Variance Decomposition of LUE to LFDI_I and LFDI_O

Period	S.E.	LFDI_I	LFDI_O
1	0.074629	0.000000	0.000000
2	0.088064	12.42482	2.124493
3	0.094010	18.81005	5.938887
4	0.096118	20.12936	7.628844
5	0.096801	20.61739	8.023254
6	0.097323	20.98173	8.146366
7	0.097656	21.26578	8.263722
8	0.097845	21.42788	8.359240
9	0.097947	21.51132	8.412781
10	0.098004	21.55770	8.439298

According to the table 4.4.4.1, there is no contribution of LFDI_I to the variability of LUE during the first quarter. However, while entering into second quarter, the role of LFDI_I is comprised of 12.42%. We can see that the role of LFDI_I in explaining the variability of LUE has increased significantly from second quarter to third quarter. After that, it is increased gradually and maintained at around 21% after all. For the LFDI_O, it is similar to the LFDI_I in which both are not playing a role in the first quarter. LFDI_O actually plays a little role in explaining the variability of LUE throughout the whole periods. LFDI_O is only comprised of 2.12% in second quarter and it is increase gradually on the next quarter to tenth quarter. It is an increasing trend, but it still in a low portion. Therefore, the LFDI_O has less effect on the LUE.

Table 4.4.4.2 Variance Decomposition of LFDI_I to LFDI_O

Period	S.E.	LFDI_O
1	0.610914	0.000000
2	0.621033	2.629219
3	0.647497	4.499654
4	0.657933	5.371594
5	0.665665	5.903505
6	0.669038	6.205027
7	0.671068	6.351742
8	0.672247	6.432277
9	0.672960	6.481973
10	0.673365	6.512085

According to the table 4.4.4.2, there is no contribution of LFDI_O to the variability of LFDI_I during the first quarter. However, while entering into second quarter, the role of LFDI_O is comprised of 2.63%. After that, we can see that the role of LFDI_O in explaining the variability of LFDI_I has increased significantly and maintained at around 6% after all.

Table 4.4.4.3 Variance Decomposition of LFDI_O to LFDI_I

Period	S.E.	LFDI_I
1	0.632925	7.791723
2	0.715876	13.55646
3	0.764342	21.63797
4	0.777299	23.06808
5	0.787258	23.85323
6	0.793393	24.40008
7	0.797119	24.76812
8	0.799089	24.95299
9	0.800192	25.05368
10	0.800838	25.11236

Based on the table 4.4.4.3, the contribution of LFDI_I to the variability of LFDI_O in the first quarter is 7.79%. From first quarter to third quarter, the result shows that they are increasing dramatically from 7.79 % to 21.64%. However, start from third quarter onwards, it has increased slightly and maintained at around 25%.

In the conclusion, from the table 4.4.4.2 and table 4.4.4.3 show that LFDI_I has larger impact on LFDI_O compared to the effect of LFDI_O on LFDI_I.

CHAPTER 5: CONCLUSION

5.0 Overview

This research paper examined various interrelationships between FDI inflow, FDI outflow and unemployment in the case of Malaysia over the periods of 1999 Q1 to 2013 Q4. In this chapter, we firstly summarized the result based on the tests conducted in our research and followed by the policy implications. Lastly, there is a part regarding the limitations and recommendations for future studies in this section as well.

5.1 Major Findings

By applying the VAR model in level form, the result shows that FDI inward and FDI outward have an impact to unemployment in the short run, but there is no long run relationship between the variables. Therefore, in the case of Malaysia, both FDI inward and FDI outward only influence unemployment in the short period of time. This can be explained when foreign investors invest in Malaysia, they require local manpower to accomplish the investment namely introduce new projects or develop the existing businesses. Thus, it will directly lead to an increase in the labor demand. In contrast, in the long term view, unemployment in Malaysia does not affected by its FDI inward and outward. Even if FDI promote economic growth, it is not always the case that foreign investment helps to generate employment. According to Stan et al. (2011), this is most probably due to the foreign investment projects in Malaysia are mostly capital-intensive in nature and it might not intensively affecting the demand for labors. Furthermore, capital in the long run can adjust flexibly correspond to the requirements of the projects. VAR method of impulse response function indicated that both FDI inward and FDI outward have a negative impact on unemployment. When either FDI inward or outward increase, it will create more job opportunities and thus it lead to a reduction in unemployment. Besides that, impulse response function also indicated that there is a positive relationship between FDI inward and FDI outward. Since FDI inward has the significant relationship with FDI outward, so both variables are playing a crucial role to influence Malaysia's unemployment. Based on variance decomposition, it shows noticeably that FDI inward actually have a greater impact compared to the FDI outward on the unemployment.

5.2 Policy Implications

Hisarciklilar et al. (n.d.) argued that the impact of FDI on unemployment greatly lean on the mode of its entry. For example, Greenfield investment is tended to create more new job opportunities, whereas mergers and acquisitions (M&A) will not directly generate any new jobs and might even decrease employment level with more efficient use of labor. Thus, the increased FDI in Malaysia in the forms of M&A is most likely to maintain rather than to create more employment. Nevertheless, the findings of this research indicated that both FDI inward and FDI outward have a significant impact on unemployment in Malaysia. Since increase in FDI inward and also FDI outward can reduce the unemployment, this research might be beneficial to the Malaysia government in terms of identifying the impact of FDI inward and FDI outward on unemployment in Malaysia. The result of this research may improve the policy effectiveness as policy implementation may focus on attracting FDI inward and encouraging FDI outward simultaneously.

Besides that, this research indicated that Malaysia government implement alternative ways on attraction FDI by putting more efforts in order to bring in more foreign investment into the country because it is advantageous to the country from the technology transfers and industrial upgrading. In order to attract more foreign investors to invest in the country, a better environment may require for Malaysia by improve the existing of domestic infrastructure, human capital development, financial system evolution and other supportive measures like less restriction, impose income tax reduction and also carry out more liberal investment policies. In addition, a stable political and sound economic for Malaysia are playing the most crucial role as these indicators are represent that the country is stable and it may be more attractive to foreign investors.

This research may also provide guidance to Malaysia government as well as policy maker to revisit its current policies in order to attract miscellaneous types of FDI to create varieties of spillovers and skill transfers. By doing this, we believe that it will lead to the productions in our country to be more value added and hence generating more job opportunities. This will certainly contribute greatly to the society as well as the country as a whole in the development. Since it can ultimately help the country to break the yoke of developing, Malaysia will move towards the realization of Vision 2020 and sooner become a developed country.

Moreover, this research indicated that FDI has strategic role to minimize the unemployment in the Malaysia context. Thus, other developing countries concentrate on FDI as a source of external finance may also promote the economic growth and at the same time reduce the unemployment of their countries.

5.3 Limitations and Recommendations for Future Studies

This is one of the crucial parts in our research which review and propose recommendations for future studies. The main purpose of this part is to improve and highlight some reasonable suggestions to the particular parties regarding the study. It is very common that every research has its own limitations. The first limitation in our research would be the small degree of freedom in the model. In our estimation using VAR method, we take only 60 sample size as our observations which are covering from 1999 Q1 to 2013 Q4. We face some difficulty while obtaining quarterly data. Therefore, we could not use larger sample size due to the availability of data is very limited. This is because high frequency data, particularly quarterly data is very difficult to collect or even non-existence in certain countries. Hence, for future research if possible, increase the sample size for a better estimation.

In addition, the time bound is playing a crucial role for the research that using time series data. Therefore, the future researchers are advice to increase the length of the sample periods as much as possible, instead of only 15 years in our research. This is because the longer data periods are being use, the result obtained will be more accurate.

The future researchers are also recommending extent the model by focusing on more indicators that will affect the unemployment such as economic growth, inflation, export and import. This is because the selected variables in this research are not strong enough to examine the major factors that affect unemployment. The other suggested variables might give a better understanding about this issue and provide a more precise result.

Moreover, our research is merely focused in the case of Malaysia. The future researchers are encouraging to expand their research scope to other country, for example Thailand, Taiwan and Indonesia. They can do some comparison between Malaysia with the other suggested countries rather than only focused solely on one country. The findings might be beneficial to those people particularly investors, researchers and economists as a guidance and references for them.

Besides that, government is playing a crucial role in assisting the future research. Since most of the researchers face the difficulty when conducting their research studies is due to the problem of limited and inadequate data, by improving the infrastructure can minimize the difficulty of the researchers in obtaining the data from database. Furthermore, the data collected from the economic reports and government websites like Bank Negara Malaysia are mostly too general. Hence, government can encourage research and development (R&D) and contribute by providing funds in order to attract researchers for carry out further research.

REFERENCES

Asari, F. F. A. H., Shamsudin, N., Kadir, R. A. H.A., Baharuddin, N. S., Affandi, S., & Jusoff, K. (2011). Impact of export and gross domestic product towards foreign direct investment inflows in Malaysia. *World Applied Sciences Journal, 12,* 27-33.

Balcerzak, A. P., & Zurek, M. (2011). Foreign direct investment and unemployment: VAR analysis for Porland in the years 1995-2009. *European Research Studies, 14*(1), 3-14.

Bailey, D., & Driffield, N. (2007). In dustrial policy, FDI and Employment: Still "missing a strategy". *J Ind Compet Trade, 7*, 189-211.

Brincikova, Z., & Darmo, L. (2014). The impact of FDI inflow on employment in V4 countries. *European Scientific Journal, 1*, 245-252.

Chang, S. C. (2005). The dynamic interactions among foreign direct investment, economic growth, exports and unemployment: evidence from Taiwan. *Econ Change, 38*, 235-256.

Chen, J. E., & Zulkifli, S. A. M. (2012). Malaysian outward FDI and economic growth. *Social and Behavioral Sciences, 65*, 717-722.

Chen, K. M. (2011). Outward foreign direct investment, wage rigidity and unemployment: A computable general equilibrium analysis. *The Journal of International Trade & Economic Development, 20*(4), 569-583.

Ciftcioglu, S., Fethi, S., & Begovic, N. (n.d.). The imact of net inflow of foreign direct investment on economic growth, unemployment and openness: A panel data analysis of nine central and east European countries.

Ciurila, N. (n.d.). Determinant factors of foreign direct investment flows in central and eastern European countries.

Har, W. M., Teo, K. L., & Yee, K.M. (2008). FDI and economic growth relationship: An empirical study on Malaysia. *International Business Research, 1*(2), 11-18.

Hisarciklilar, M., Karakas, D. G., & Asici, A. A. (n.d.). Can FDI be a panacea for unemployment?: The Turkish case.

Hua, L. (n.d.). Analysis of FDI's employment structure effect based on panel data.

Jajri, I. (n.d.). Foreign direct investment and economic growth: A simultaneous model.

Lin, M. Y., & Wang, J. S. (n.d.). Outward capital flow and unemployment.

Marhani, M. A., Adnan, H. Baharuddin, H. E., Esa, M. R., & Hasssan, A. A. (2012). Dependency of foreign workers in Malaysian construction industry. *Built Environment Journal*, *9*(1), 39-50.

Mpanju, A. K. (2012). The impact of foreign direct investment on employment creation in Tanzania.*ZENITH International Journal of Business Econamics & Management*, *2*(1), 126-139.

Mucuk, M., & Demirsel, M. T. (2013). The effect of foreing direct investments on unemployment: Evidence from panel data for seven developing countries. *Journal of Business, Economics & Finance, 2*(3), 53-66.

Palat, M. (2011). The impact of foreign direct investment on unemployment in Japan. *ACTA Universitatis Agriculture ET Silviculture Mendeliane Brunensis, LIX*(7), 261-266.

Rizvi, S. Z. A., & Nishat, M. (2009). The impact of foreign direct investment on employment opportunities: Panel data analysis.

Saat, M. R., Noor, A. H. M., & Nor, A. H. S. M. (2012). Outward foreign direct investment (OFDI) drivers in developing economies: A case of Malaysia. *Business & Management Quarterly Review*, *3*(1), 26-34.

Shaari, M, S., Hassain, N. E., & Halim, M. S. A. (2012). The impact of foreign direct investment on the unemployment rate an economic growth in Malaysia. *Journal of Applied Sciences Research*, *8*(9), 4900-4906.

Stan, L. S. P., Kok, S. C., Mori, K., Mulok, D., Mansur, K., & Loganathan, N. (2011). Empirical analysis of employment and foreign direct investment in Malaysia: An ARDL bounds testing approach to cointegration. *Advances in Management & Applied Economics, 1*(3), 77-91.

Wang, D. T., Gu, F. F. Tse, D. K., & Yim, C.K. (2013). When does FDI matter? The roles of local institutions and ethnic origins of FDI. *International Business Review, 22*, 450-465.

Zeb, N., Qiang, F., & Sharif, M. F. (2014). Foreign direct investment and unemployment reduction in Pakistan. *Int. J. Eco. Res*, *5*(2), 10-17.

APPENDICES

Appendix 1: Unit Root Tests

1.1 Augmented Dickey-Fuller Test – (Level Form - Stationary Intercept with No Trend)

1.1.1 LUE

Null Hypothesis: LUE has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.498893	0.0000
Test critical values:	1% level	-3.546099	
	5% level	-2.911730	
	10% level	-2.593551	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LUE)
Method: Least Squares
Date: 08/16/14 Time: 15:41
Sample (adjusted): 2 60
Included observations: 59 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LUE(-1)	-0.609983	0.110928	-5.498893	0.0000
C	0.731024	0.134444	5.437365	0.0000

R-squared	0.346614	Mean dependent var	-0.005809
Adjusted R-squared	0.335151	S.D. dependent var	0.103294
S.E. of regression	0.084224	Akaike info criterion	-2.077363
Sum squared resid	0.404340	Schwarz criterion	-2.006938
Log likelihood	63.28220	Hannan-Quinn criter.	-2.049872
F-statistic	30.23782	Durbin-Watson stat	1.669709
Prob(F-statistic)	0.000001		

1.1.2 LFDI_I

Null Hypothesis: LFDII has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.215854	0.0000
Test critical values:	1% level	-3.546099	
	5% level	-2.911730	
	10% level	-2.593551	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LFDI)
Method: Least Squares
Date: 08/16/14 Time: 15:36
Sample (adjusted): 2 60
Included observations: 59 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LFDI(-1)	-0.816052	0.131286	-6.215854	0.0000
C	7.305501	1.175944	6.212454	0.0000

R-squared	0.403995	Mean dependent var	0.013733
Adjusted R-squared	0.393539	S.D. dependent var	0.807407
S.E. of regression	0.628773	Akaike info criterion	1.943216
Sum squared resid	22.53524	Schwarz criterion	2.013641
Log likelihood	-55.32488	Hannan-Quinn criter.	1.970707
F-statistic	38.63684	Durbin-Watson stat	2.082284
Prob(F-statistic)	0.000000		

1.1.3 LFDI_O

Null Hypothesis: LFDIO has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.065454	0.0022
Test critical values:	1% level	-3.546099	
	5% level	-2.911730	
	10% level	-2.593551	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LFDIO)
Method: Least Squares
Date: 08/16/14 Time: 15:39
Sample (adjusted): 2 60
Included observations: 59 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LFDIO(-1)	-0.445100	0.109483	-4.065454	0.0001
C	3.969325	0.976255	4.065871	0.0001

R-squared	0.224784	Mean dependent var	0.014577
Adjusted R-squared	0.211184	S.D. dependent var	0.712820
S.E. of regression	0.633094	Akaike info criterion	1.956913
Sum squared resid	22.84603	Schwarz criterion	2.027338
Log likelihood	-55.72895	Hannan-Quinn criter.	1.984405
F-statistic	16.52792	Durbin-Watson stat	2.073371
Prob(F-statistic)	0.000149		

1.2 Augmented Dickey-Fuller Test – (Level Form - Stationary Intercept with Trend)

1.2.1 LUE

Null Hypothesis: LUE has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic based on SIC, MAXLAG=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.229950	0.0004
Test critical values:	1% level	-4.124265	
	5% level	-3.489228	
	10% level	-3.173114	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LUE)
Method: Least Squares
Date: 08/16/14 Time: 15:55
Sample (adjusted): 3 60
Included observations: 58 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LUE(-1)	-0.739048	0.141311	-5.229950	0.0000
D(LUE(-1))	0.234891	0.120957	1.941939	0.0574
C	0.930042	0.179211	5.189663	0.0000
@TREND(1)	-0.001320	0.000678	-1.948580	0.0565

R-squared	0.344013	Mean dependent var	-0.000795
Adjusted R-squared	0.307569	S.D. dependent var	0.096681
S.E. of regression	0.080451	Akaike info criterion	-2.135876
Sum squared resid	0.349504	Schwarz criterion	-1.993777
Log likelihood	65.94041	Hannan-Quinn criter.	-2.080526
F-statistic	9.439569	Durbin-Watson stat	1.943636
Prob(F-statistic)	0.000041		

1.2.2 LFDI_I

Null Hypothesis: LFDII has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic based on SIC, MAXLAG=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.872915	0.0000
Test critical values:	1% level	-4.121303	
	5% level	-3.487845	
	10% level	-3.172314	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LFDII)
Method: Least Squares
Date: 08/16/14 Time: 15:45
Sample (adjusted): 2 60
Included observations: 59 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LFDI(-1)	-0.916209	0.133307	-6.872915	0.0000
C	7.855567	1.155518	6.798311	0.0000
@TREND(1)	0.011496	0.004881	2.355271	0.0220

R-squared	0.457714	Mean dependent var	0.013733
Adjusted R-squared	0.438346	S.D. dependent var	0.807407
S.E. of regression	0.605099	Akaike info criterion	1.882660
Sum squared resid	20.50412	Schwarz criterion	1.988298
Log likelihood	-52.53848	Hannan-Quinn criter.	1.923897
F-statistic	23.63324	Durbin-Watson stat	2.029310
Prob(F-statistic)	0.000000		

1.2.3 LFDI_O

Null Hypothesis: LFDIO has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic based on SIC, MAXLAG=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.724342	0.0001
Test critical values:	1% level	-4.121303	
	5% level	-3.487845	
	10% level	-3.172314	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LFDIO)
Method: Least Squares
Date: 08/18/14 Time: 07:08
Sample (adjusted): 2 60
Included observations: 59 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LFDIO(-1)	-0.745259	0.130191	-5.724342	0.0000
C	6.017834	1.056597	5.695484	0.0000
@TREND(1)	0.020614	0.005755	3.581687	0.0007

R-squared	0.369272	Mean dependent var	0.014577
Adjusted R-squared	0.346746	S.D. dependent var	0.712820
S.E. of regression	0.576131	Akaike info criterion	1.784546
Sum squared resid	18.58791	Schwarz criterion	1.890183
Log likelihood	-49.64410	Hannan-Quinn criter.	1.825782
F-statistic	16.39311	Durbin-Watson stat	1.906566
Prob(F-statistic)	0.000002		

1.3 Philips-Perron Test - (Level Form - Stationary Intercept with No Trend)

1.3.1 LUE

Null Hypothesis: LUE has a unit root
Exogenous: Constant
Bandwidth: 2 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-5.545347	0.0000
Test critical values:	1% level	-3.546099	
	5% level	-2.911730	
	10% level	-2.593551	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.006853
HAC corrected variance (Bartlett kernel)	0.007484

Phillips-Perron Test Equation
Dependent Variable: D(LUE)
Method: Least Squares
Date: 08/16/14 Time: 15:42
Sample (adjusted): 2 60
Included observations: 59 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LUE(-1)	-0.609983	0.110928	-5.498893	0.0000
C	0.731024	0.134444	5.437365	0.0000

R-squared	0.346614	Mean dependent var	-0.005809
Adjusted R-squared	0.335151	S.D. dependent var	0.103294
S.E. of regression	0.084224	Akaike info criterion	-2.077363
Sum squared resid	0.404340	Schwarz criterion	-2.006938
Log likelihood	63.28220	Hannan-Quinn criter.	-2.049872
F-statistic	30.23782	Durbin-Watson stat	1.669709
Prob(F-statistic)	0.000001		

1.3.2 LFDI_I

Null Hypothesis: LFDII has a unit root
Exogenous: Constant
Bandwidth: 4 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-6.516281	0.0000
Test critical values:	1% level	-3.546099	
	5% level	-2.911730	
	10% level	-2.593551	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.381953
HAC corrected variance (Bartlett kernel)	0.524310

Phillips-Perron Test Equation
Dependent Variable: D(LFDII)
Method: Least Squares
Date: 08/16/14 Time: 15:39
Sample (adjusted): 2 60
Included observations: 59 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LFDI(-1)	-0.816052	0.131286	-6.215854	0.0000
C	7.305501	1.175944	6.212454	0.0000

R-squared	0.403995	Mean dependent var	0.013733
Adjusted R-squared	0.393539	S.D. dependent var	0.807407
S.E. of regression	0.628773	Akaike info criterion	1.943216
Sum squared resid	22.53524	Schwarz criterion	2.013641
Log likelihood	-55.32488	Hannan-Quinn criter.	1.970707
F-statistic	38.63684	Durbin-Watson stat	2.082284
Prob(F-statistic)	0.000000		

1.3.3 LFDI_O

Null Hypothesis: LFDIO has a unit root
Exogenous: Constant
Bandwidth: 0 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.065454	0.0022
Test critical values:	1% level	-3.546099	
	5% level	-2.911730	
	10% level	-2.593551	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.387221
HAC corrected variance (Bartlett kernel)	0.387221

Phillips-Perron Test Equation
Dependent Variable: D(LFDIO)
Method: Least Squares
Date: 08/16/14 Time: 15:40
Sample (adjusted): 2 60
Included observations: 59 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LFDIO(-1)	-0.445100	0.109483	-4.065454	0.0001
C	3.969325	0.976255	4.065871	0.0001

R-squared	0.224784	Mean dependent var	0.014577
Adjusted R-squared	0.211184	S.D. dependent var	0.712820
S.E. of regression	0.633094	Akaike info criterion	1.956913
Sum squared resid	22.84603	Schwarz criterion	2.027338
Log likelihood	-55.72895	Hannan-Quinn criter.	1.984405
F-statistic	16.52792	Durbin-Watson stat	2.073371
Prob(F-statistic)	0.000149		

1.4 Philips-Perron Test - (Level Form - Stationary Intercept with Trend)

1.4.1 LUE

Null Hypothesis: LUE has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 1 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-5.742520	0.0001
Test critical values:	1% level	-4.121303	
	5% level	-3.487845	
	10% level	-3.172314	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.006650
HAC corrected variance (Bartlett kernel)	0.007702

Phillips-Perron Test Equation
Dependent Variable: D(LUE)
Method: Least Squares
Date: 08/16/14 Time: 15:57
Sample (adjusted): 2 60
Included observations: 59 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LUE(-1)	-0.662476	0.117322	-5.646639	0.0000
C	0.821152	0.150339	5.462021	0.0000
@TREND(1)	-0.000891	0.000681	-1.307872	0.1963

R-squared	0.365980	Mean dependent var	-0.005809
Adjusted R-squared	0.343336	S.D. dependent var	0.103294
S.E. of regression	0.083704	Akaike info criterion	-2.073552
Sum squared resid	0.392356	Schwarz criterion	-1.967915
Log likelihood	64.16979	Hannan-Quinn criter.	-2.032316
F-statistic	16.16264	Durbin-Watson stat	1.644421
Prob(F-statistic)	0.000003		

1.4.2 LFDI_I

Null Hypothesis: LFDII has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 3 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-6.975491	0.0000
Test critical values:	1% level	-4.121303	
	5% level	-3.487845	
	10% level	-3.172314	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.347527
HAC corrected variance (Bartlett kernel)	0.418155

Phillips-Perron Test Equation
Dependent Variable: D(LFDI)
Method: Least Squares
Date: 08/16/14 Time: 15:47
Sample (adjusted): 2 60
Included observations: 59 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LFDI(-1)	-0.916209	0.133307	-6.872915	0.0000
C	7.855567	1.155518	6.798311	0.0000
@TREND(1)	0.011496	0.004881	2.355271	0.0220

R-squared	0.457714	Mean dependent var	0.013733
Adjusted R-squared	0.438346	S.D. dependent var	0.807407
S.E. of regression	0.605099	Akaike info criterion	1.882660
Sum squared resid	20.50412	Schwarz criterion	1.988298
Log likelihood	-52.53848	Hannan-Quinn criter.	1.923897
F-statistic	23.63324	Durbin-Watson stat	2.029310
Prob(F-statistic)	0.000000		

1.4.3 LFDI_O

Null Hypothesis: LFDIO has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 5 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-5.600181	0.0001
Test critical values:	1% level	-4.121303	
	5% level	-3.487845	
	10% level	-3.172314	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.315049
HAC corrected variance (Bartlett kernel)	0.267804

Phillips-Perron Test Equation
Dependent Variable: D(LFDIO)
Method: Least Squares
Date: 08/16/14 Time: 15:57
Sample (adjusted): 2 60
Included observations: 59 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LFDIO(-1)	-0.745259	0.130191	-5.724342	0.0000
C	6.017834	1.056597	5.695484	0.0000
@TREND(1)	0.020614	0.005755	3.581687	0.0007

R-squared	0.369272	Mean dependent var	0.014577
Adjusted R-squared	0.346746	S.D. dependent var	0.712820
S.E. of regression	0.576131	Akaike info criterion	1.784546
Sum squared resid	18.58791	Schwarz criterion	1.890183
Log likelihood	-49.64410	Hannan-Quinn criter.	1.825782
F-statistic	16.39311	Durbin-Watson stat	1.906566
Prob(F-statistic)	0.000002		

1.5 Kwiatkowski-Phillips-Schmidt-Shin (Level Form - Stationary Intercept with No Trend)

1.5.1 LUE

Null Hypothesis: LUE is stationary
Exogenous: Constant
Bandwidth: 4 (Newey-West using Bartlett kernel)

		LM-Stat.
Kwiatkowski-Phillips-Schmidt-Shin test statistic		0.471770
Asymptotic critical values*:	1% level	0.739000
	5% level	0.463000
	10% level	0.347000

*Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1)

Residual variance (no correction)	0.009651
HAC corrected variance (Bartlett kernel)	0.018363

KPSS Test Equation
Dependent Variable: LUE
Method: Least Squares
Date: 08/18/14 Time: 07:16
Sample: 1 60
Included observations: 60

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.207104	0.012790	94.38200	0.0000

R-squared	0.000000	Mean dependent var	1.207104
Adjusted R-squared	0.000000	S.D. dependent var	0.099068
S.E. of regression	0.099068	Akaike info criterion	-1.769504
Sum squared resid	0.579048	Schwarz criterion	-1.734598
Log likelihood	54.08512	Hannan-Quinn criter.	-1.755850
Durbin-Watson stat	1.072154		

1.5.2 LFDI_I

Null Hypothesis: LFDII is stationary
Exogenous: Constant
Bandwidth: 4 (Newey-West using Bartlett kernel)

		LM-Stat.
Kwiatkowski-Phillips-Schmidt-Shin test statistic		0.408445
Asymptotic critical values*:	1% level	0.739000
	5% level	0.463000
	10% level	0.347000

*Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1)

Residual variance (no correction)	0.389063
HAC corrected variance (Bartlett kernel)	0.728788

KPSS Test Equation
Dependent Variable: LFDII
Method: Least Squares
Date: 08/18/14 Time: 07:18
Sample: 1 60
Included observations: 60

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.946131	0.081205	110.1669	0.0000

R-squared	0.000000	Mean dependent var	8.946131
Adjusted R-squared	0.000000	S.D. dependent var	0.629013
S.E. of regression	0.629013	Akaike info criterion	1.927197
Sum squared resid	23.34378	Schwarz criterion	1.962102
Log likelihood	-56.81590	Hannan-Quinn criter.	1.940850
Durbin-Watson stat	1.620202		

1.5.3 LFDI_O

Null Hypothesis: LFDIO is stationary
Exogenous: Constant
Bandwidth: 5 (Newey-West using Bartlett kernel)

		LM-Stat.
Kwiatkowski-Phillips-Schmidt-Shin test statistic		0.841956
Asymptotic critical values*:	1% level	0.739000
	5% level	0.463000
	10% level	0.347000

*Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1)

Residual variance (no correction)	0.558451
HAC corrected variance (Bartlett kernel)	1.733985

KPSS Test Equation
Dependent Variable: LFDIO
Method: Least Squares
Date: 08/18/14 Time: 07:19
Sample: 1 60
Included observations: 60

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.889496	0.097290	91.37146	0.0000

R-squared	0.000000	Mean dependent var	8.889496
Adjusted R-squared	0.000000	S.D. dependent var	0.753602
S.E. of regression	0.753602	Akaike info criterion	2.288622
Sum squared resid	33.50707	Schwarz criterion	2.323528
Log likelihood	-67.65867	Hannan-Quinn criter.	2.302276
Durbin-Watson stat	0.879906		

1.6 Kwiatkowski-Phillips-Schmidt-Shin (Level Form - Stationary Intercept with Trend)

1.6.1 LUE

Null Hypothesis: LUE is stationary
Exogenous: Constant, Linear Trend
Bandwidth: 2 (Newey-West using Bartlett kernel)

		LM-Stat.
Kwiatkowski-Phillips-Schmidt-Shin test statistic		0.128558
Asymptotic critical values*:	1% level	0.216000
	5% level	0.146000
	10% level	0.119000

*Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1)

Residual variance (no correction)	0.008485
HAC corrected variance (Bartlett kernel)	0.011924

KPSS Test Equation
Dependent Variable: LUE
Method: Least Squares
Date: 08/18/14 Time: 07:20
Sample: 1 60
Included observations: 60

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.265272	0.023891	52.96090	0.0000
@TREND(1)	-0.001972	0.000698	-2.823298	0.0065

R-squared	0.120826	Mean dependent var	1.207104
Adjusted R-squared	0.105668	S.D. dependent var	0.099068
S.E. of regression	0.093687	Akaike info criterion	-1.864943
Sum squared resid	0.509084	Schwarz criterion	-1.795132
Log likelihood	57.94829	Hannan-Quinn criter.	-1.837636
F-statistic	7.971014	Durbin-Watson stat	1.217297
Prob(F-statistic)	0.006503		

1.6.2 LFDI_I

Null Hypothesis: LFDII is stationary
Exogenous: Constant, Linear Trend
Bandwidth: 4 (Newey-West using Bartlett kernel)

		LM-Stat.
Kwiatkowski-Phillips-Schmidt-Shin test statistic		0.047534
Asymptotic critical values*:	1% level	0.216000
	5% level	0.146000
	10% level	0.119000

*Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1)

Residual variance (no correction)	0.344725
HAC corrected variance (Bartlett kernel)	0.523552

KPSS Test Equation
Dependent Variable: LFDII
Method: Least Squares
Date: 08/18/14 Time: 07:23
Sample: 1 60
Included observations: 60

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.587449	0.152281	56.39208	0.0000
@TREND(1)	0.012159	0.004452	2.731275	0.0083

R-squared	0.113961	Mean dependent var	8.946131
Adjusted R-squared	0.098684	S.D. dependent var	0.629013
S.E. of regression	0.597170	Akaike info criterion	1.839536
Sum squared resid	20.68351	Schwarz criterion	1.909347
Log likelihood	-53.18607	Hannan-Quinn criter.	1.866843
F-statistic	7.459864	Durbin-Watson stat	1.828058
Prob(F-statistic)	0.008344		

1.6.3 LFDI_O

Null Hypothesis: LFDIO is stationary
Exogenous: Constant, Linear Trend
Bandwidth: 1 (Newey-West using Bartlett kernel)

		LM-Stat.
Kwiatkowski-Phillips-Schmidt-Shin test statistic		0.104638
Asymptotic critical values*:	1% level	0.216000
	5% level	0.146000
	10% level	0.119000

*Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1)

Residual variance (no correction)	21488638
HAC corrected variance (Bartlett kernel)	23868586

KPSS Test Equation
Dependent Variable:L FDIO
Method: Least Squares
Date: 08/18/14 Time: 07:24
Sample: 1 60
Included observations: 60

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1792.703	1202.303	1.491057	0.1414
@TREND(1)	254.5071	35.14715	7.241188	0.0000

R-squared	0.474803	Mean dependent var	9300.664
Adjusted R-squared	0.465748	S.D. dependent var	6450.495
S.E. of regression	4714.830	Akaike info criterion	19.78758
Sum squared resid	1.29E+09	Schwarz criterion	19.85739
Log likelihood	-591.6274	Hannan-Quinn criter.	19.81489
F-statistic	52.43481	Durbin-Watson stat	1.732398
Prob(F-statistic)	0.000000		

Appendix 2: Diagnostic Checking

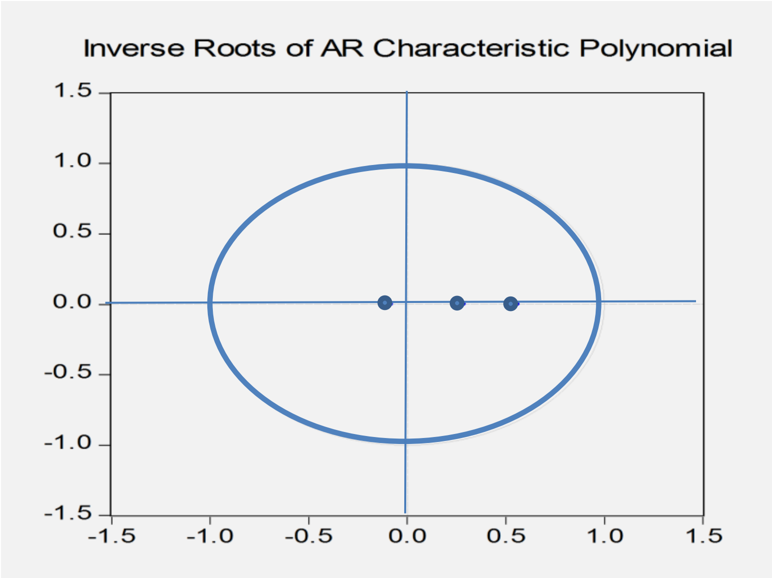
2.1 Lag Order Selection Criteria

VAR Lag Order Selection Criteria
Endogenous variables: LUE LFDII LFDIO
Exogenous variables: C
Date: 08/18/14 Time: 20:39
Sample: 1 60
Included observations: 55

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-47.98464	NA	0.001282	1.853987	1.963478	1.896328
1	-28.93821	35.32247	0.000890*	1.488662*	1.926626*	1.658026*
2	-22.99465	10.37421	0.000998	1.599805	2.366242	1.896193
3	-12.09725	17.83211*	0.000939	1.530809	2.625718	1.954219
4	-3.366398	13.33439	0.000963	1.540596	2.963978	2.091030
5	3.534677	9.786980	0.001065	1.616921	3.368775	2.294377

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

2.2 Inverse Roots of AR Characteristic Polynomial



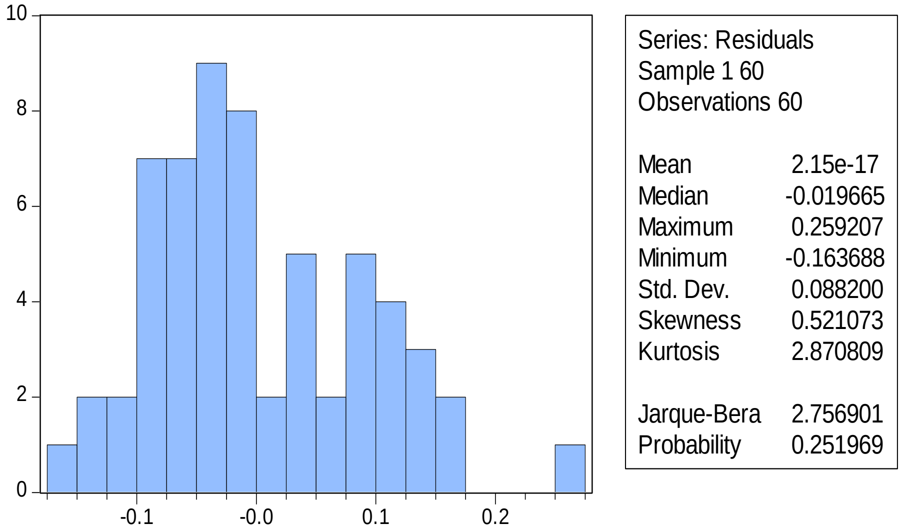
2.3 Breusch-Godfrey Serial Correlation LM Tests

VAR Residual Serial Correlation LM Tests
Null Hypothesis: no serial correlation at lag order h
Date: 08/18/14 Time: 20:41
Sample: 1 60
Included observations: 59

Lags	LM-Stat	Prob
1	12.98219	0.1634
2	4.896296	0.8433
3	22.25702	0.0081
4	12.26310	0.1989
5	11.44416	0.2465
6	4.972182	0.8367

Probs from chi-square with 9 df.

2.4 Normality Test (Jarque-Bera Test)



Appendix 3: Vector Autoregressive (VAR) Model

3.1 Vector Autoregression Estimates

Vector Autoregression Estimates
Date: 08/18/14 Time: 20:42
Sample (adjusted): 2 60
Included observations: 59 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	LUE	LFDII	LFDIO
LUE(-1)	0.210246	-0.309391	0.305262
	(0.11232)	(0.90655)	(0.94093)
	[1.87193]	[-0.34128]	[0.32442]
LFDII(-1)	-0.045864	0.035461	0.169262
	(0.01799)	(0.14523)	(0.15073)
	[-2.54902]	[0.24417]	[1.12292]
LFDIO(-1)	-0.027380	0.243189	0.508661
	(0.01575)	(0.12715)	(0.13197)
	[-1.73813]	[1.91266]	[3.85436]
C	1.601264	6.845276	2.498989
	(0.25753)	(2.07865)	(2.15749)
	[6.21776]	[3.29314]	[1.15829]
R-squared	0.353594	0.111142	0.326469
Adj. R-squared	0.318336	0.062659	0.289731
Sum sq. resids	0.318051	20.72051	22.32218
S.E. equation	0.076044	0.613789	0.637070
F-statistic	10.02863	2.292384	8.886390
Log likelihood	70.36348	-52.84818	-55.04465
Akaike AIC	-2.249609	1.927057	2.001514
Schwarz SC	-2.108759	2.067907	2.142364
Mean dependent	1.202146	8.949156	8.899651
S.D. dependent	0.092105	0.633972	0.755919
Determinant resid covariance (dof adj.)		0.000728	
Determinant resid covariance		0.000590	
Log likelihood		-31.78374	
Akaike information criterion		1.484195	
Schwarz criterion		1.906745	

3.2 Granger Causality Test

VAR Granger Causality/Block Exogeneity Wald Tests
Date: 08/18/14 Time: 20:43
Sample: 1 60
Included observations: 59

Dependent variable: LUE

Excluded	Chi-sq	df	Prob.
LFDII	6.497523	1	0.0108
LFDIO	3.021086	1	0.0822
All	14.92174	2	0.0006

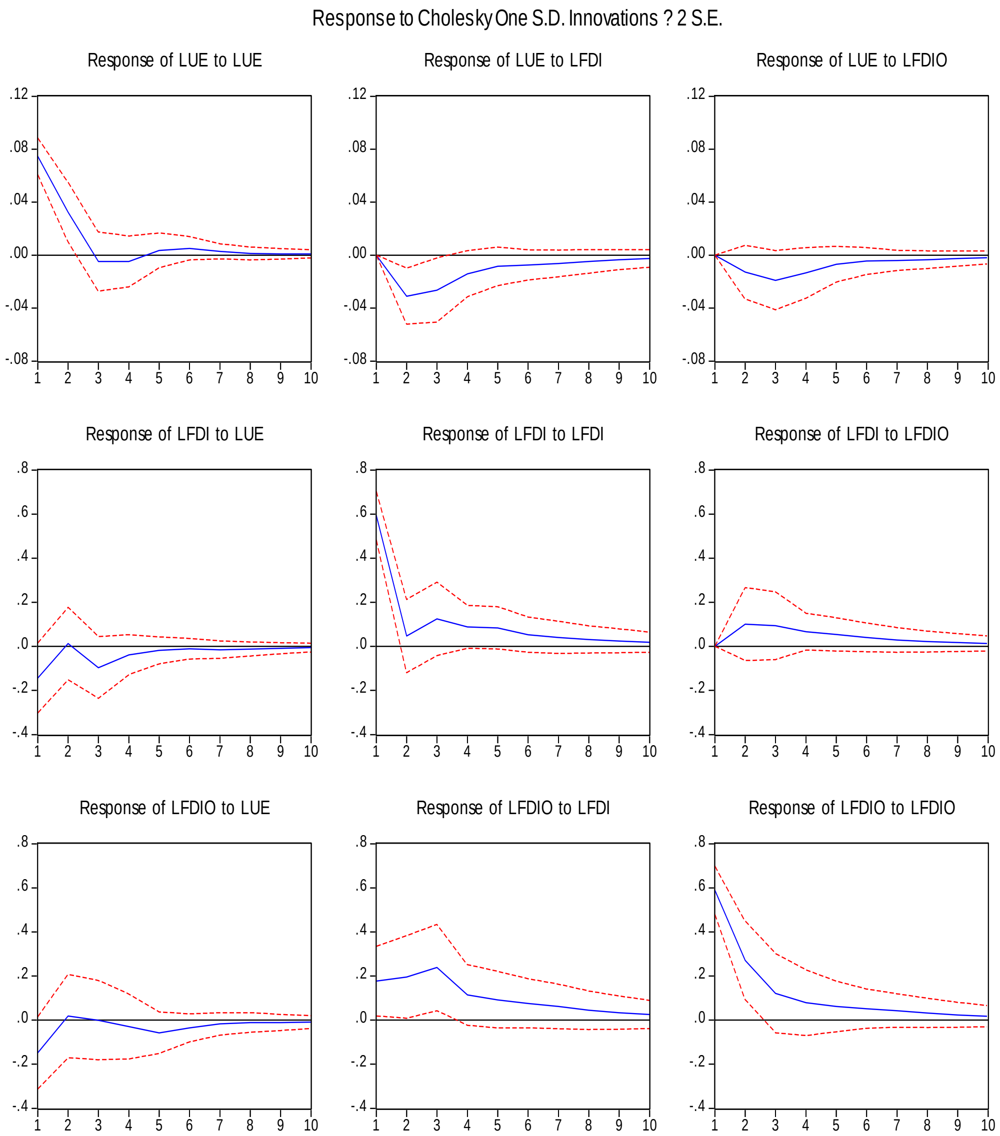
Dependent variable: LFDII

Excluded	Chi-sq	df	Prob.
LUE	0.116475	1	0.7329
LFDIO	3.658260	1	0.0558
All	4.816961	2	0.0900

Dependent variable: LFDIO

Excluded	Chi-sq	df	Prob.
LUE	0.105252	1	0.7456
LFDII	1.260941	1	0.2615
All	1.290722	2	0.5245

3.3 Impulse Response Function



3.4 Variance Decomposition

Variance Decomposition of LUE: Period	S.E.	LUE	LFDI	LFDIO
1	0.074629	100.0000	0.000000	0.000000
2	0.088064	85.45069	12.42482	2.124493
3	0.094010	75.25106	18.81005	5.938887
4	0.096118	72.24180	20.12936	7.628844
5	0.096801	71.35936	20.61739	8.023254
6	0.097323	70.87191	20.98173	8.146366
7	0.097656	70.47050	21.26578	8.263722
8	0.097845	70.21288	21.42788	8.359240
9	0.097947	70.07590	21.51132	8.412781
10	0.098004	70.00300	21.55770	8.439298
Variance Decomposition of LFDI: Period	S.E.	LUE	LFDI	LFDIO
1	0.610914	5.529679	94.47032	0.000000
2	0.621033	5.394526	91.97625	2.629219
3	0.647497	7.191965	88.30838	4.499654
4	0.657933	7.302827	87.32558	5.371594
5	0.665665	7.210595	86.88590	5.903505
6	0.669038	7.167353	86.62762	6.205027
7	0.671068	7.176493	86.47177	6.351742
8	0.672247	7.185206	86.38252	6.432277
9	0.672960	7.186104	86.33192	6.481973
10	0.673365	7.185002	86.30291	6.512085
Variance Decomposition of LFDIO: Period	S.E.	LUE	LFDI	LFDIO
1	0.632925	5.502915	7.791723	86.70536
2	0.715876	4.365076	13.55646	82.07847
3	0.764342	3.829121	21.63797	74.53291
4	0.777299	3.845206	23.06808	73.08671
5	0.787258	4.287691	23.85323	71.85908
6	0.793393	4.423151	24.40008	71.17677
7	0.797119	4.427944	24.76812	70.80393
8	0.799089	4.425643	24.95299	70.62136
9	0.800192	4.432599	25.05368	70.51372
10	0.800838	4.439457	25.11236	70.44818

Cholesky Ordering:
LUE LFDI LFDIO