Impact of Foreign Direct Investment on the Unemployment Rate in Malaysia

IMPACT OF FOREIGN DIRECT INVESTMENT ON THE UNEMPLOYMENT RATE IN MALAYSIA

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Abstract. Malaysia as a developing country needs support from other countries for economic growth. This is done by receiving massive foreign direct investment (FDI) which contributes to a higher employment rate. Higher employment leads to a better living among Malaysians while increasing its gross domestic product (GDP). During 2009, Malaysia faced a downward trend on the FDI. In many studies, decreasing FDI affects employment rate significantly. This study focuses on the impact of FDI on employment rate in Malaysia. Other factors such as the number of foreign workers, gross domestic product (GDP) and exchange rate (EXCR) are also included in the study. Data used in the study is annual data spanning from 1980 to 2012. Autoregressive distributed lag (ARDL) model is used to determine the long run relationship between the variables. The study finds that FDI, number of foreign workers, and GDP significantly influence the unemployment rate in Malaysia.

1. Introduction

According to the global report published by International Labour Organization (ILO), Malaysia was ranked as the 20th country with the lowest unemployment rate of 3.1% in 2013 in the world. The highest unemployment rate in 2013 is in Mauritania (30.8%), followed by Macedonia (29.8%), Bosnia (29.2%), Greece (28.1%) and Spain (27.2%). A large increase on unemployment rate occurred in Greece and Spain compared to the lowest rate of 7.7% and 8.4% since 2007 respectively. In 2012, about 396,300 Malaysian were unemployed which counted 3.0% of unemployment rate.

Based on the world statistics of unemployment rate, it is possible for a country to achieve lower unemployment rate of less than 1% such as Cambodia (0.3%), Qatar (0.5%), Rwanda (0.6%), and Thailand (0.7%). Researchers in Malaysia has studied the factors leading to high unemployment rate and one of the strategies was to attract foreign investors to invest in Malaysia so that they can bring in new technology and expertise. Based on past studies, inward foreign direct investment (IFDI) is found to be important in helping to decrease the unemployment rate in Malaysia. It can be seen in Figure 1.1 where the fluctuation of employment rate in Malaysia after 1986 reduced significantly with the rapid increment of IFDI and maintain below 4% ever since showing the successfulness of the initiatives done to overcome the unemployment problem.

Other factors which affected the unemployment significantly were exchange rate [13] gross domestic product [8] and foreign labour. Unemployment rate increased with the increasing of

exchange rate while unemployment rate decreased with the increasing of gross domestic product. The penetration of foreign labour into the labour market system avoiding the shortage of labour. Somehow, the eccessive of illegal foreign labour will affect the labour system and causing unemployment problem among the local labours for a lower wages compared to minimum wages of RM900 in peninsula and RM800 in Sabah, Sarawak and the Federal Territory of Labuan.

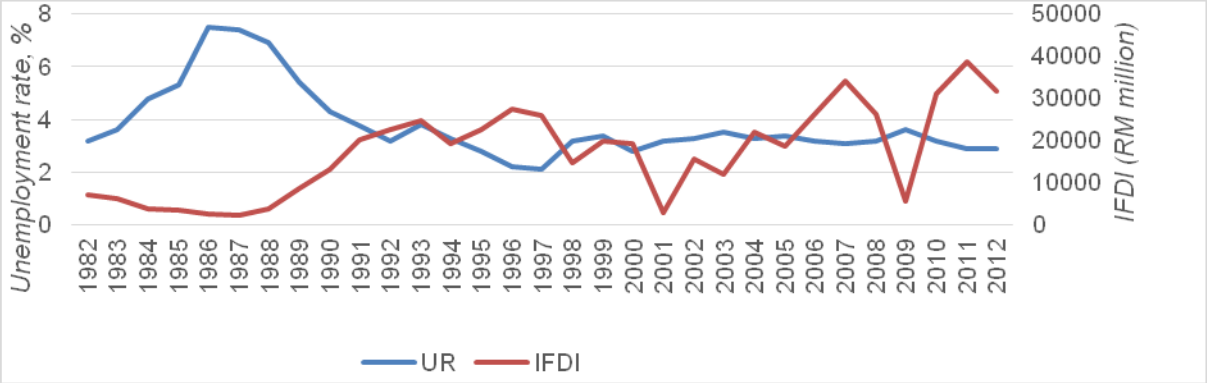

Figure 1.1: Fluctuation of unemployment and inward FDI in Malaysia

Source: Unemployment rate by Department of Statistics Malaysia (DoSM) and inward FDI by United Nations Conference on Trade and Development (UNCTAD)

The rising unemployment rate in 1982 to 1986 is mainly caused by the low level of labour utilization. At this time, unemployment was very high among the young, particularly those in the age of 15 to19 and 20 to 24 age groups which were about three times of the overall unemployment rate. Most of the unemployed were first-time job seekers, hence improvement in education and skill level of the labour force were implemented. The wider usage of new technology and equipment resulted in higher labour productivity and value added as well as employability among them.

Major economic sector in Malaysia was agriculture and shortfall in job creation occurred due to the slower performance, rural labour supply constraints, and low investment in this sector. Shortage of labour during late 1940s, particularly in plantation sector, continued into early 1980s. In addition to that, the world tin market crisis reduced the employment in mining from 80,100 in 1980 to 60,500 in 1985. The tin mining was major activity in mining sector. In response to this, the government acted by converting the mining land for agricultural purposes, constructing feeder roads to support agriculture and constructing low-cost housing units to increase utilization of local material and employment opportunities. In doing so, foreign labours were needed to avoid labour shortage and to maximize the agricultural productivity. These foreign workers provided the needed skills and new technologies.

IFDI helps decreasing the unemployment rate until 1997 when the global financial crisis affected the Malaysian economy resulted in increasing unemployment rate of 2.1 per cent in 1997 to 3.2 per cent in 1998. Malaysia faced negative growth of real GDP (-7.4 per cent) in 1998 and retrenchment soared to 83,865 workers in 1998 as compared to approximately 19,000 in 1997 [5].

Then in 2001 IFDI reached the lowest IFDI (RM 2,762 million) since 1987 (RM2,173 million) compared to the average of RM17,206 million. This is affected by the economic recession and 911 incident of the US World Trade Centre which affect the Malaysian unemployment rate with the lower level of exports to the US and lower IFDI resulted in slow growth in the economy as well as increasing in unemployment rate. In 2009, IFDI once again dropped to RM 5,573.6 million due to global financial crisis.

In general, large amount of IFDI created wider job market for local labour as well as technological assistance and expertise to Malaysia. This financial assistance helps Malaysia to strengthen the economy with the optimal level of employment and local production. Somehow, high IFDI allowing rapid development on the manufacturing industry which caused the shortage of labour that encouraged foreign investor to bring in the foreign labour for the production and also attracting the illegal foreign labour to work in Malaysia, creating the disequilibrium of labour market system due to unreliable data of labour force. Furthermore, the dependency on foreign investment has caused Malaysia to face great impact on the unemployment especially during the economy recession.

Based on previous studies, there were many factors which influenced the unemployment rate. Factors which influenced unemployment are also different between places due to social behaviour and economic development. Many African and Latin American countries face high unemployment rates due to under development of infrastructures and economies [6]. [15] reveals that high unemployment contribute to high crime rate in Malaysia. While according to Okun's Law, unemployment has a negative effect to the output or economic growth. Hence the study of unemployment is very important and need to be revised from time to time in alignment to the development and economic condition of the country.

In this study, relationship and impacts of both inward and outward foreign direct investment (IFDI and OFDI), Gross Domestic Product (GDP), exchange rate (EXCR), and foreign labour (FL) are to be determined. Other factors not included in the study were oil price, capital stock, status of development, rural or urban area, wages, labour utilization, money supply and reduction of demand. Thus, this study aims to firstly identify the long run relationship between IFDI, OFDI, GDP, EXCR and FL on unemployment and then secondly to investigate the short and long run impact of the factors on unemployment in Malaysia. This study might help the policymakers to make a suitable revision and stimulate the employability strategy so that the unemployment rate as well as crime rate can be decreased.

2. Literature review

Both inward foreign direct investment (IFDI) and outward foreign direct investment (OFDI) are important in developing country. Projects funded by foreign investors produced more job market for both skilled and unskilled labours. This is supposed to reduce the unemployment rate [1, 7, 12, 14, 16]. High OFDI is also important as it utilized many labours, both local and foreign, for the production to be exported out.

However, some foreign investors prefer to bring in unskilled foreign labours as they were cheaper in terms of wages. Starting from 2012 Malaysia has implemented the minimum wage gazette of RM900 for workers in Peninsula at the private sector and RM800 for workers in Sabah, Sarawak and Federal Territory of Labuan which attract foreign labours to penetrate Malaysia's job market [4].

As a developing country, foreign direct investment is important to boost our economy. Aligned with that, demands for cheaper, unskilled workers are getting higher from Vietnam, Indonesia, Cambodia and China compared to local labours. This reducing the chances of unskilled local labour to find jobs as the wages offered to foreign labour is cheaper. Even worse foreign investors tend to invest to the neighbouring countries instead of Malaysia and decelerating the growth of the Malaysian economy. This situation may shrink the job market and increase the unemployment rate as the development injected by foreign investors fund provided huge skilled and unskilled job market [4].

Most of the foreign labours in Malaysia are from Indonesia. Study on the push and pull factors on it has been done by [3]. Result showed that low income (GDP) and high unemployment in the home country lead them to move in order to find jobs in Malaysia with higher GDP and low unemployment rate.

Larger FDI produced more job market and thus improving the gross domestic product (GDP). GDP represents the income of a country. Higher income leads to low unemployment rate [7] and stable economy while low income leads to high unemployment rate. During the economic recession between 2008 and 2009, [8] stated that Malaysia GDP growth was -4.23%. Majority of developing countries faced growth deceleration with positive growth. However, some of the developing countries faced positive impact on unemployment rate while the rest faced negative impact. Malaysia faced an increasing on unemployment rate at 11.11%. This situation is not good for social development hence larger domestic economies and having healthier reserves were seen as the strategy to withstand the shock of the recession.

Exchange rate is influenced by economic stability of a country. Bad reputation on economics by decelerating growth or negative growth may cause exchange rate to increase, resulted in the high unemployment. This is supported by [7, 13] in their study which stated that exchange rate positively influences the unemployment rate.

3. Methodology

Data used in the study is annual data from 1982 until 2012 collected from Department of Statistics Malaysia, International Monetory Fund (IMF) and United Nations Conference on Trade and Development (UNCTAD) . Eviews software was used to analyse the data.

Autoregressive Distributed Lags (ARDL) was used for the analysis. It is originally introduced by [10] and further extended by [11]. This model was used as it is applicable if variables are integrated at level I(0) and first difference I(1). Furthermore, it can be applied for small sample size data and for different variables to have different optimal number of lags.

Linear model specification can be presented as:

$$UR_t = \alpha_0 + \alpha_1 IFDI_t + \alpha_2 OFDI_t + \alpha_3 GDP_t + \alpha_4 EXCR_t + \alpha_5 FL_t + u_t \quad (1)$$

Where

UR is the unemployment rate reported by Department of Statistics Malaysia (DoSM),
IFDI is inward foreign direct investment reported by UNCTAD,
OFDI is outward foreign direct investment reported by UNCTAD,
GDP is gross domestic product reported by IMF,
EXCR is Malaysia exchange rate reported by IMF,,
FL is foreign labour registered reported by DOSM, and
u is the error term.

An ARDL representation of equation (1) is formulated as follows:

$$\Delta UR_t = \alpha_0 + \sum_{i=1}^{n} \alpha_{1i}\, \Delta UR_{t-i} + \sum_{i=1}^{n} \alpha_{2i}\, \Delta IFDI_{t-i} + \sum_{i=1}^{n} \alpha_{3i}\, \Delta OFDI_{t-i} + \sum_{i=1}^{n} \alpha_{4i}\, \Delta GDP_{t-i} + \sum_{i=1}^{n} \alpha_{5i}\, \Delta EXCR_{t-i} + \sum_{i=1}^{n} \alpha_{6i}\, \Delta FL_{t-i} + \beta_1 UR_{t-i} + \beta_2 IFDI_{t-i} + \beta_3 OFDI_{t-i} + \beta_4 GDP_{t-i} + \beta_5 EXCR_{t-i} + \beta_6 FL_{t-i} + e_t \quad (2)$$

Where

Δ denotes the first difference operator,
α_0 is the drift component,
e_t is the usual white noise residuals.

The left-hand side is the unemployment rate. The first until fifth expressions ($\beta_1 - \beta_6$) on the right-hand side correspond to the long-run relationship. The remaining expressions with the summation sign ($\alpha_1 - \alpha_6$) represent the short-run dynamics of the model.

Co-integration test was done to investigate the long run relationship among the variables. A series of time series variables are co-integrated when some linear combination of them is stationary. For co-integration test, bound testing was used due to several reasons that includes all variables are assumed to be endogenous and simultaneous estimation of short and long run coefficient can be determined. The presence of co-integration denotes that there is a long run relationship among the variables. Co-integrated variables exhibit mean reverting spread that force the variables to move around the common stochastic trends. The test is based on F-Test which rely on the hypothesis of:

$H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = 0$

There is no co-integration among the variables

$H_0: \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq \beta_6 \neq 0$

There is co-integration among the variables

The ARDL bound test is based on the Wald-test (F-statistic). The asymptotic distribution of the Wald-test is non-standard under the null hypothesis of no co-integration among the variables. Two critical values are given by [11] for the co-integration test. The lower critical bound assumes all the variables are I(0) meaning that there is no co-integration relationship between the examined variables. The upper bound assumes that all the variables are I(1) meaning that there is co-integration among the variables. When the computed F-statistic is greater than the upper bound critical value, then the H0 is rejected (the variables are co-integrated). If the F-statistic is below the lower bound critical value, then the H0 cannot be rejected (there is no co-integration among the variables). When the computed F-statistics falls between the lower and upper bound, then the results are inconclusive.

In the meantime, the unrestricted error correction model (UECM) was developed based on the assumption made by [11]. From the unrestricted error correction model, the long-run elasticities are the coefficient of the one lagged explanatory variable (multiplied with a negative sign) divided by the coefficient of the one lagged dependent variable.

Thus, equation (2) in the ARDL version of the error correction model can be expressed as equation (3). If the co-integration exists, the error correction part will be included in the model to identify the duration for the system to be in equilibrium condition. Error correction (EC_{t-1}) is the error of linear regression between variables in the study. The error correction version of ARDL model pertaining to the variables in equation (2) is as follows:

$$\Delta UR_t = \alpha_0 + \sum_{i=1}^{n} \alpha_{1i} \Delta UR_{t-i} + \sum_{i=1}^{n} \alpha_{2i} IFDI_{t-i} + \sum_{i=1}^{n} \alpha_{3i} \Delta OFDI_{t-i} + \sum_{i=1}^{n} \alpha_{4i} \Delta GDP_{t-i} + \sum_{i=1}^{n} \alpha_{5i} \Delta EXCR_{t-i} + \sum_{i=1}^{n} \alpha_{6i} \Delta FL_{t-i} + \lambda EC_{t-i} + e_t \quad (3)$$

where λ is the speed of adjustment parameter and EC is the residuals that are obtained from the estimated co-integration model of equation (1). The error correction model shows the change in unemployment is related to the change in other variables, as well as the gap between the variables in the previous period.

4. Findings

The analysis was started with co-integration checking among the variables involved in the study. The first practice in applying any co-integration technique is to determine the degree of integration of each variable. For this reason, the ADF test was employed. The test results are presented in table 4.1.

Table 4.1: Results of ADF tests

Variable	Level		First differences	
	Constant	Constant and trend	Constant	Constant and trend
UR	-1.4217(0)	-2.1923(0)	-4.0284(0)***	-3.5171(1)*
IFDI	-2.3433(0)	-3.2017(0)	-7.3803(0)***	-7.2441(0)***
OFDI	-1.1315(0)	-3.3578(0)*	-7.4372(0)*	-7.3323(0)***
GDP	-1.0183(0)	-1.1154(0)	-4.3866(0)***	-4.4055(0)***
EXCR	-1.5852(0)	-1.2571(0)	-4.6341(0)***	-4.7245(0)***
FL	-1.4220(0)	-1.7408(0)	-5.0587(0)***	-5.0077(0)***

Notes:
1. *, **, *** imply significance at the 1%, 5%, 10% level, respectively.
2. The numbers within parentheses for the ADF (Dickey-Fuller 1979) statistics represents the lag length of the dependent variable used to obtain white noise residuals.
3. The lag length for the ADF was selected using Akaike Information Criterion (AIC).

The results of table 4.1 indicate that the variables are integrated at order I(0) and I(1). For this reason ARDL model approach is used for the co-integration of the model.

The main advantage of this approach lies on the fact that it obviates the need to classify variables into I(1) or I(0). Moreover, compared to the standard co-integration test, there is no need for unit root pre-testing.

The ARDL co-integration test, assumed that only one long run relationship exists between the dependent variable and the exogenous variables [11].

Table 4.2 presents the co-integration results of the variables used in equation 2, using F-test with the [9] which are quoted in small samples. The results of table 4.2 show that F-statistic is greater than critical values, indicating that there is co-integration between the variables, hence 2 lags used in the analysis.

Table 4.2: The results of F-Test for Co-integration

Order of lag	*1*	*2*	*3*
UR	2.4560	4.8109**	8.2985

Notes:
1. *, **, *** denotes that the F-statistic falls above the 90% upper bound, above the 95% upper bound, and above the 99% upper bound respectively.
2. According to [9] the existing critical values reported in [11] cannot be used for small sample sizes because they are based on large sample sizes. [9] provides a set of critical values for sample sizes ranging from 30 to 80 observations. They are 2.496 - 3.346 at 90%, 2.962 – 3.910 at 95%, and 4.068 – 5.250 at 99%.

In the second stage, Akaike's information criterion (AIC) was employed in selecting the lag length on each first differenced variable. Results shows that ARDL (1,2,1,1,2,0) is the most suitable model to be used in the study. Based on the ARDL model, long run estimation was estimated. As can be seen in Table 4.3, all the long run coefficients are listed.

In the long run, LIFDI and LFL significantly affect the unemployment rate where 1% increase of these items may reduce the unemployment rate in Malaysia by 0.255% and 0.625% respectively.

Table 4.3: Estimates of the long run coefficients based on ARDL model

Long run coefficients			
AIC – ARDL (1,2,1,1,2,0)			
Dependent variable: LUR	Coefficient	Standard error	t-stat
LIFDI	-0.2553	0.0731	-3.4954***
LOFDI	-0.4877	0.0657	-0.7422
LEXCR	-0.4435	0.3815	-1.1626
LGDP	0.5525	0.3261	1.6946
LFL	-0.6254	0.1938	-3.2263***
C	-0.9384	3.1087	-0.3019

Notes:
1. *, **, *** indicate significance at 10%, 5%, and 1% level respectively

The results of the short-run dynamic and the various diagnostic tests are presented in Tables 4.4. Panel A reports the coefficient estimates of all lagged first differenced variables in the ARDL model (short-run coefficient estimates). A negative and significant coefficient of EC_{t-1} will be an indication of co-integration. Panel B reports some diagnostic statistics. The diagnostic tests include the test of serial autocorrelation (χ^2 Auto), normality (χ^2 Norm), and heteroscedasticity (χ^2 White).

Table 4.4: Error correction representation of ARDL(1,2,1,1,2,0) model

Panel A: AIC – ARDL (1,2,1,1,2,0)			
Dependent variable: LUR			
	Coefficient	***Standard error***	***t-stat***
ΔLIFDI	-0.1223	0.0368	-3.3249***
ΔLIFDI(-1)	0.0725	0.0298	2.4311**
ΔLOFDI	0.0586	0.0302	1.9408*
ΔLEXCR	0.3358	0.03404	0.9863
ΔLGDP	-1.3010	0.8152	-1.5959
ΔLGDP(-1)	-2.3883	-0.6382	-3.7420***
ΔLFL	-0.3416	0.1398	-2.4439**
Constant	-0.5125	1.6885	-0.3036
ECM(-1)	-0.5462	0.1348	-4.0527***
ECM = LUR + 0.2554*LIFDI + 0.4877*LOFDI + 0.4435*LEXCR – 0.5525*LGDP + 0.6254*LFL + 0.9384*C			
R-squared	0.8912	DW statistic	2.3087
F (8,20)	16.3887***	RSS	0.0868
Panel B: Diagnostic test			
χ^2_{Auto}	1.1459[0.301]	χ^2_{White}	0.1442[0.707]
χ^2_{Norm}	0.0313[0.862]		

Notes:
1. *, **, *** indicate significance at 10%, 5%, and 1% level respectively
2. χ^2 Auto is the Breusch–Godfrey LM test for autocorrelation.
3. χ^2 Norm is the Jarque–Bera normality test.
4. χ^2 White is the White test for heteroscedasticity

Not much interpretation could be attached to the short-run coefficients. The result shows the dynamic adjustment of all variables. Surprisingly, LIFDI, LGDP and LFL also have impact in the short run, showing that all these factors are the strong causal effect of the unemployment rate in Malaysia.

As can be seen from table 4.4 at panel A, the EC (-1) carries an expected negative sign, which is highly significant, indicating that, variables are co-integrated. The absolute value of the coefficient of the error-correction term indicates that about 55% percent of the disequilibrium in the unemployment rate is offset by short-run adjustment in each year. This means that low unemployment rate is followed in the next period by a changes in the other variables. Thus, it is important to reduce the existing disequilibrium over time in order to maintain long-run equilibrium.

The diagnostic tests presented in the lower panel B of Table 4.4 show that there is no evidence of diagnostic problem with the model. Measuring the explanatory power of the equations by their adjusted R^2 show that roughly 89.12% of the variation in unemployment rate can be explained by the independent variables. The Lagrange Multiplier (LM) test of autocorrelation suggests that the residuals are not serially correlated. According to the Jarque-Bera (JB) test, the null hypothesis of normally distributed residuals cannot be rejected. The White heteroscedasticity test suggest that the disturbance term in the equation is homoscedastic.

The existence of a stable and predictable relationship between the unemployment rate and its determinants is considered a necessary condition to reduce poverty and crime rates [15]. The stability of the long-run coefficients are used to form the error-correction term in conjunction with the short run dynamics. Some of the problems of instability could stem from inadequate modelling of the short-run dynamics characterizing departures from the long run relationship. Hence, it is important to incorporate the short run dynamics for constancy of long run parameters. In view of this we apply the CUSUM and CUSUMSQ tests.

The CUSUM test is based on the cumulative sum of recursive residuals based on the first set of n observations. It is updated recursively and is plotted against the 18 break points. If the plot of CUSUM statistic stays within 5% significance level, then estimated coefficients are said to be stable. Similar procedure is used to carry out the CUSUMSQ that is based on the squared recursive residuals. A graphical presentation of these two tests is provided in Figures 4.1 and 4.2.

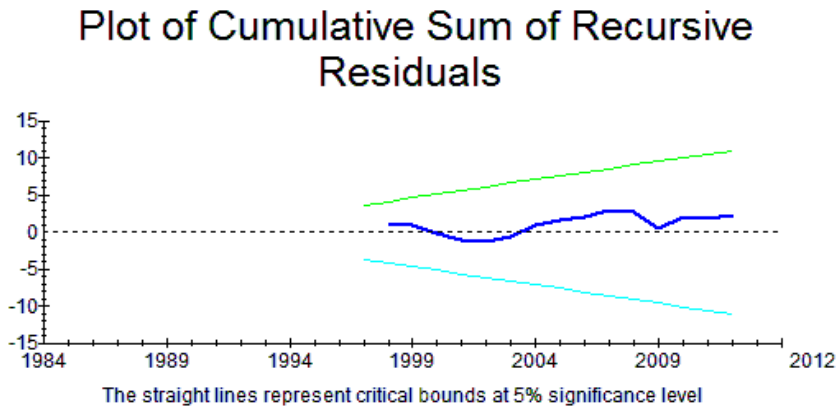

Figure 4.1: Cumulative sum of recursive residuals

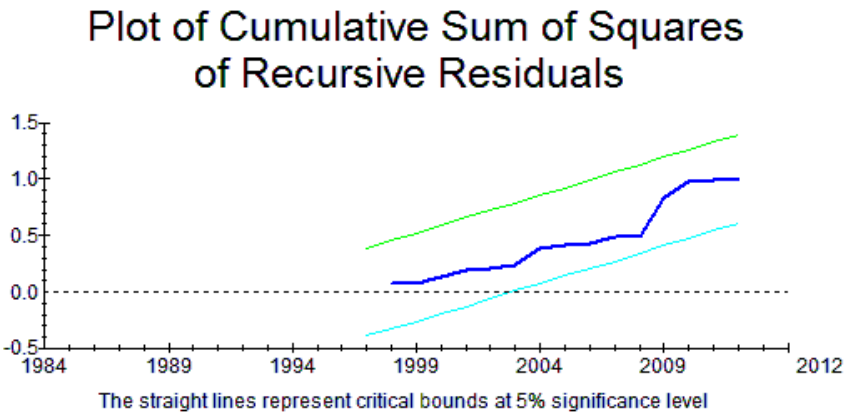

Figure 4.2: Cumulative sum of squares of recursive residuals

Since the plots of CUSUM and CUSUMSQ statistic marginally cross the critical value lines, we are safe to conclude that unemployment rate is stable.

5. Conclusion and Recommendation

Unemployment rate should be reduced to avoid shortage of national production and waste of human resources. Okun's Law stated that there is a negative relationship between unemployment and output (GDP). The lower the unemployment the higher GDP should be produced. [17] said unemployment is significantly affecting GDP in Malaysia where one percent decrease in unemployment contribute to 1.75% increase in the GDP. On the other hand, the decreasing of unemployment may reduce the crime rate in Malaysia [15].

From the result of the study, among all potential factors contribute to unemployment, FDI support and foreign workers are significantly reducing the unemployment rate. This is clearly seen from 1982 to 1991 where the unemployment reached 7.5% and rapid inward FDI reduced it significantly. It also shows that domestic plan to facilitate construction work would not provide enough job market for the Malaysian. Outward FDI also important as the opportunities to develop network between countries. International trade will allow the domestic market to supply goods for international demand, create more job opportunities and reduce unemployment rate. The increasing number of foreign labours in Malaysia are aligned with the increasing of FDI inflows as many foreign companies hire cheaper labours from other countries instead of local labours.

Finally, Malaysia as a developing country, should focus on attracting foreign direct investment inward and outward to reduce the unemployment rate. Somehow, with the advancement of technology and higher financial aids, foreign investors may monopoly the market and affect the local producer as well as bringing more foreign workers to Malaysia. The increasing number of foreign labours contributes both positive and negative effect to the country. As they contribute to the local production and new technology learning, the government is also facing the problem of the increasing estimated government subsidy on fuel, transportation, and education. Hence, government need to control the penetration of foreign investment on the local market by imposing the joint venture policy so that the local producers have the opportunities to learn new technologies and ideas as well as sharing the profit earned.

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