

COULD INWARD FDI OFFSET THE SUBSTITUTION EFFECT OF OUTWARD FDI ON DOMESTIC INVESTMENT? EVIDENCE FROM MALAYSIA

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Abstract:

It is well documented in the literature that Malaysia has become an emerging source of outward foreign direct investment (OFDI) in the region. The drastic increase in its OFDI has raised concerns as to whether the outbound direct investment activities from the country would detract from domestic investment activities, which have been sluggish since the aftermath of the Asian Currency Crisis. Using the autoregressive distributed lag (ARDL) modelling approach to cointegration, the findings show that there is a long-run equilibrium relationship involving the four variables, *i.e.* between domestic investment and its determinants such as FDI outflows, FDI inflows and domestic savings. Moreover, this study reveals that the effect on domestic investment by FDI outflows is substitutional and inelastic, while that by FDI inflows is complementary and elastic, implying that the latter can overcome the substitution effect caused by the former if the Malaysian government could formulate pragmatic policies in attracting FDI inflows.

Keywords: outward FDI, inward FDI, domestic investment, multinationals, Malaysia.

JEL Classification: F21

1. Introduction

Malaysia used to be one of the major recipients of foreign direct investment (FDI) among Asian economies. In 1995, for instance, Malaysia was the second largest FDI recipient among the Asian economies with USD 5.8 billion (UNCTAD, 1996). FDI inflows have played an important role in the development of Malaysia's economy in terms of technology transfer (Ali, 1994; Choong *et al.*, 2005), export market linkages (Wong and Tang, 2007) and have been contributing to gross domestic capital formation

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(Atan, 1994), which is also seen as an important source of growth for the nation's economy. Comparable evidence of the positive impacts of FDI inflows can be found in the Central and Eastern Europe (CEE), *e.g.* Holland and Pain's (1998) findings suggest that inward FDI was instrumental in raising productivity during the transitional phase of economic development in CEE, Carstensen and Toubal (2003) found complementary relationship between trade flows and FDI¹; Campos and Kinoshita (2008) showed robust empirical relationship between structural reforms (especially financial reform and privatisation) and FDI; Bijsterbosch and Kolasa (2009) highlighted that FDI could lead to higher productivity growth.

There has been a rapid growth in outward FDI (OFDI) from Malaysia and the upward trend has been evident since 2005 (see Figure 1). The main push factors that caused the increase in OFDI from the country are the rising cost of labour as a result of rapid industrialisation (Sim, 2005; Tham, 2007) and the home country strong exchange rate effect that decreased the home country's nominal export competitiveness. The strong ringgit also induced domestic firms to invest abroad owing to lower start-up cost for Malaysian MNCs (Kueh *et al.*, 2008 and 2009; Goh and Wong, 2011). In addition, the main pull factor that influenced domestic firms to invest abroad was the relatively larger foreign market size, *e.g.* People's Republic of China, and the accessibility to nearby countries, *e.g.* ASEAN (*i.e.* Association of Southeast Asian) region. For instance, Hiratsuka (2006), who examined OFDI from Malaysia as part of the ASEAN5 region, reported that cross-border direct investment in a developing country with a large market could be driven by both market- and efficiency-seeking FDI.

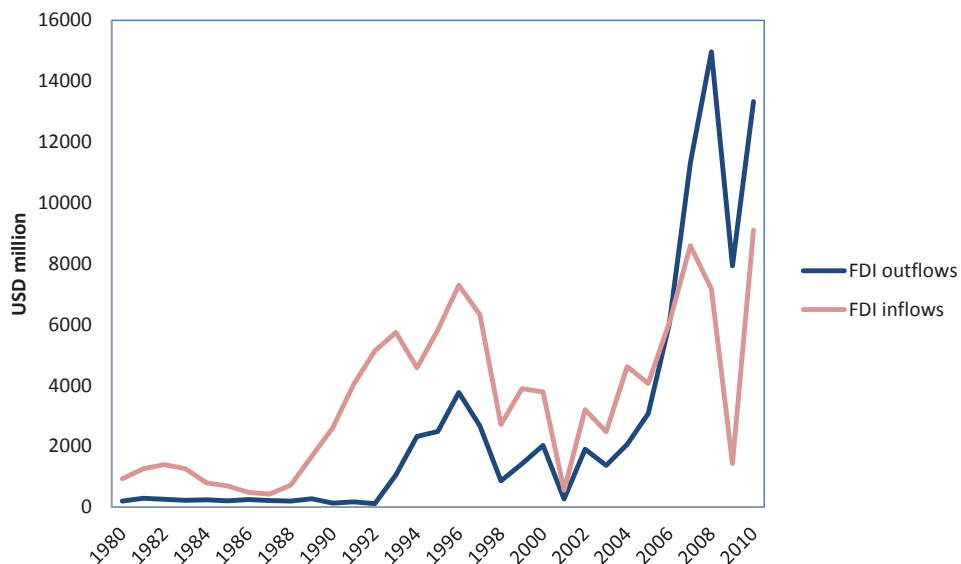
From 2007 onwards, the country's OFDI exceeded its inward FDI (IFDI) (see Figure 1). The shift from being net recipients to net sources of FDI poses two imperative empirical questions, firstly, whether OFDI can substitute or complement domestic investment, and secondly, whether IFDI can more than offset the substitution effect of OFDI on domestic investment given the fact that IFDI has a high propensity to promote domestic investment. One major factor that influences Malaysian domestic firms' decision to invest abroad is the higher profit opportunities of the host market relative to the home market especially when the former has a relatively larger market size (Goh and Wong, 2011). So, strategically speaking, seizing higher profit opportunities abroad and internationalizing business activities are not only instrumental in making Malaysian firms part of the global production network but also could potentially aid them to develop themselves into regional or global players. By and large, the drastic increase in Malaysia's OFDI stock from USD 753 million in 1990 to USD 96,758 million in 2010² reflects poor domestic investment opportunities resulting in a reallocation of resources to more prospective investment opportunities abroad (see Athukorala, 2009).

1 Goh *et al.* (2012) found there is no linkage between OFDI and trade in the case of Malaysia.

2 It is obtained from UNCTAD's statistical databases at: http://unctadstat.unctad.org/ReportFolders/reportFolders.aspx?sRF_ActivePath=P,5,27&sRF_Expanded=P,5,27

We also found that the transitional economies from the CEE region also experienced a rapid growth in its OFDI since 2005 (see Figure 2) as a consequence of economic transformation from a centrally planned economic system to a market-oriented economic system that encourages domestic firms to develop competitive advantages for their internationalisation through FDI. For instance, there was an eight-fold increase in OFDI between 2005 and 2008, escalated from USD 8,470 million to USD 82,080 million. Nevertheless, Figure 2 depicts that the CEE economies at large are in transition from the second stage to the third stage of the Investment Development Path (Dunning, 1981 and 1986) *i.e.* despite there are growing ownership advantages for domestic firms, they are still the net recipients of FDI due to the locational advantages in the CEE economies (Kalotay, 2004). Figure 2 also indicates that to a larger extent, the global recession caused a seven *per cent* decline in FDI inflows in the CEE region, suggesting the regional economy is vulnerable to global economic shock.

Figure 1

Malaysia's FDI Inflows and Outflows, 1980 to 2010

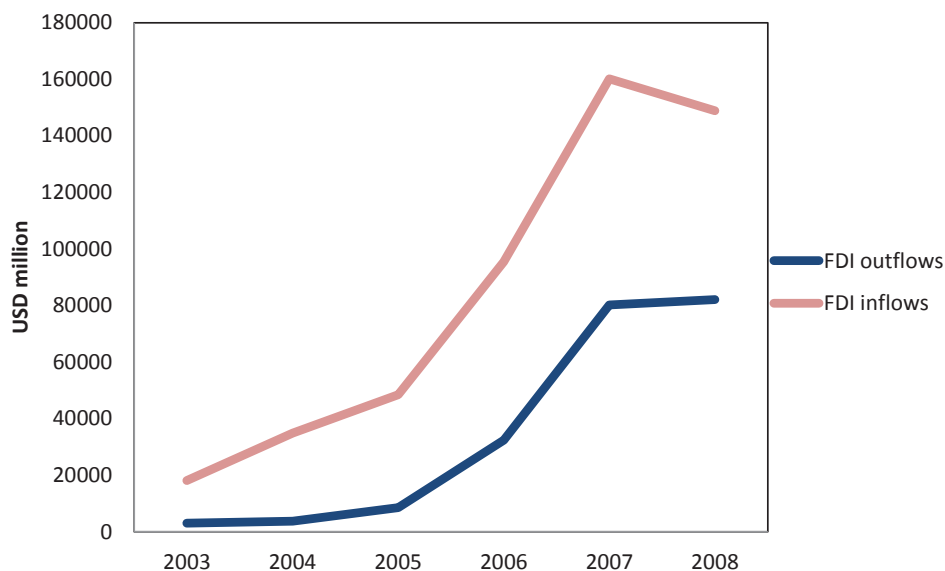
Source: UNCTAD's statistical databases.

In the existing literature, one view argues that cross-border outward direct investment may divert resources away from domestic investment activities when domestic production is relocated abroad due to diminished investment opportunities in the home economy (Stevens and Lipsey, 1992). Therefore, OFDI is seen as a substitute for domestic investment. But, OFDI may not have a negative impact on domestic investment if multinational investment activities are financed from external resources (Kim, 2000). Conversely, OFDI is complementary to domestic investment owing to intra-firm trade

activities,³ *e.g.* foreign affiliates use home inputs to produce outputs in the host country (Desai *et al.*, 2005). So, theoretically speaking, OFDI can either promote or impede domestic investment.

Figure 2

Central and Eastern Europe's FDI Inflows and Outflows



Source: Data extracted from IMF Data Warehouse: Balance of Payments Statistics, World Regional Aggregate.

The empirical studies on the impact of OFDI on domestic investment are mixed. The findings that show OFDI and domestic investment are substitutes can be found in Svensson (1993), Feldstein (1995), Andersen and Hainaut (1998) and Desai *et al.* (2005). On the other hand, the empirical studies by Stevens and Lipsey (1992), Desai *et al.* (2005) and Herzer and Schrooten (2007)⁴ indicate that OFDI did not detract from domestic investment and are, instead, complements. The differing evidence in the above studies, to some extent, varies with the type of data used such as cross-country data, country- and firm-level time-series data. However, a major weakness with cross-country studies is that they implicitly assume that the panel countries have similar economic structures and are at the same stage of economic development. As pointed out by Desai *et al.* (2005, p. 9), the cross sectional evidence may be confounded by omitted variables.

3 Moreover, home sourcing activities by foreign affiliates open an important channel to boost merchandise export trade (see Wong and Goh, 2013).

4 For instance, using cointegrating techniques, Herzer and Schrooten (2007) found that there was a complementary relationship between OFDI from Germany and its domestic investment in the short run, and, a substitutional one in the long run.

The contributions of the present study are threefold. First, it attempts to ascertain the effects of OFDI from Malaysia on its domestic investment in both the short- and long-run since Malaysia is one of the largest sources of OFDI in the region⁵. The drastic increase in Malaysia's OFDI has raised concerns about the impact of these cross-border direct investment activities on the nation's private domestic investment which has been sluggish since the aftermath of the Asian Currency Crisis. Second, it can provide further evidence to the empirical literature since the available evidence is limited for a developing economy such as Malaysia. Finally, the findings can also prove to be useful for policy implications for the country's economic development and the internationalization of Malaysian firms in the era of globalization.

The rest of this paper is organized as follows. Section 2 gives the specifications of the model with theoretical considerations based on Feldstein and Horioka's (1980) and Feldstein's (1995) studies using a co-integration technique. It also provides a description of the data used for this empirical study. Section 3 reports the results. The main conclusions and the policy implications are presented in Section 4.

2. Model Specification, Data and Method

Model Specification

The fundamental model that underlies the relationship between domestic investment and savings was first developed by Feldstein and Horioka (1980, hereafter F-H), who argued that if there is perfect capital mobility, it will be reflected by a low correlation between the ratio of gross domestic investment and gross national savings to GDP. Moreover, Feldstein (1995) extended the F-H model by including OFDI and IFDI variables to explore the impact of OFDI on domestic investment. Therefore, the theoretical model in this study takes the following form:

$$GDI / GDP = \beta_0 + \beta_1(GNS / GDP) + \beta_2(IFDI / GDP) + \beta_3(OFDI / GDP) + \mu$$

where GDI is the gross domestic investment, GNS is the gross national savings, GDP is gross domestic product, OFDI and IFDI are the outward and inward FDI, respectively and μ is the stochastic disturbance.

β_1 is expected to be positive, *ceteris paribus*, the increase in domestic savings implies that more funds are available for domestic investment. Therefore, GNS/GDP is expected to be positively related to GDI/GDP. Likewise, β_2 is expected to be positive because other things being equal, an increase in IFDI can contribute to domestic capital formation. Thus, IFDI/GDP tends to be positively related to GDI/GDP. Nonetheless, β_3 is postulated to be either positive or negative depending on whether OFDI complements or substitutes GDI. For instance, the former occurs when OFDI involves intra-firm trade activities while the latter arises when OFDI takes place at the expense of domestic production activities.

5 According to UNCTAD (2008), Malaysia was ranked second after Singapore in terms of FDI outflows in the Southeast Asian region.

Data

In this study, all the time-series data are quarterly and expressed as a ratio of GDP in natural logarithmic terms. Gross fixed capital formation (GFCF) is used to measure GDI. By definition, gross capital formation includes only investments, which are carried out within the geographic boundaries of the home country. Both OFDI and IFDI data are flow variables, which are able to capture the net changes in assets or new investments. All the above series including gross domestic savings (GDS) are obtained from the Bank Negara Malaysia's (BNM) *Monthly Statistical Bulletin*. Moreover, the estimation period is from 1999Q1 to 2010Q3. The choice of this sample period is based on the availability of the data especially the FDI data. As we know, BNM has since 1999 released and published the quarterly FDI in its *Monthly Statistical Bulletin* when it compiled its balance of payments according to the methodology set forth in BPM5 (*i.e.*, the fifth edition of the *Balance of Payments Manual*) of the IMF. However, it has stopped publishing the quarterly data since 2010Q4.

Method

The most appropriate co-integration approach to analyse the long-run effect of OFDI on GDI in this study is the "bounds" testing approach developed by Pesaran *et al.* (2001), which is based on the OLS (ordinary least squares) estimation of an ARDL (Autoregressive Distributed Lag) equation. The rationale for using this modelling approach to co-integration is that the IFDI variable is found to be $I(0)$ in levels and the unit root test results for this variable are inconclusive (see Table 1 in Section 3). As we know, one of the advantages of using the "bounds" testing approach is that it does not require pre-testing for the order of integration of each variable of interest and yet, it can be used to examine the long-run effect of OFDI on GDI irrespective of whether the underlying regressors are $I(0)$ or $I(1)$. Another advantage of the "bounds" testing approach over the Engle and Granger (1987) and Johansen (1995) methods of co-integration is that the former is robust in capturing long-run relationships with small sample sizes especially for the present study, which has only 47 quarterly observations over the period 1999Q1 to 2010Q3. The critical values based on samples as small as 30 observations for the "bounds" test are made available by Narayan (2005). Previous studies that have applied the ARDL approach for a relatively small sample size can be found in Gounder (1999; 2002), Pattichis (1999), Tang (2001; 2002), Tang and Nair (2002) and Wong and Tang (2008), to name a few.

Prior to testing whether there is a long-run relationship for the ARDL equation, it is essential to determine the most appropriate lag length for the model. Short-lag lengths may lead to incorrect specification, but we also face the problem of degrees of freedom if long lags are used. Given that we are constrained by the number of observations, as a rule of thumb, a maximum lag length of four quarters is imposed on the ARDL equation initially. Then, the parsimonious ARDL equation is selected using the Akaike Information Criterion and Schwartz Bayesian Criterion before testing for long-run relationships using the F -statistic (Wald test). The null hypothesis of no long-run

relationship is rejected if the computed F -statistic is greater than the upper critical bound as tabulated by Narayan (2005). However, if the computed F -statistic is less than the lower critical bound, then, the test fails to reject the null, suggesting that a long-run relationship does not exist. In the case that the test statistic lies within the lower and upper critical bounds, conclusive inference can only be made if the order of integration of each regressor is known (Pesaran *et al.*, 2001).

3. Empirical Results

Although the ARDL framework does not require the pre-testing of each variable for a unit root, the unit root test results can be used to confirm whether the ARDL model should be used or not. Table 1 reports the results of unit root tests using Augmented Dickey-Fuller (ADF) and ADF_GLS. Both tests could not reject the null hypothesis of a unit root for all the variables (in level terms) except LFDI. However, if these variables are written in first differences, both tests clearly suggest the rejection of the null hypothesis implying that all variables are $I(1)$ excluding the LFDI variable, which is $I(0)$ or inconclusive. Hence, the ARDL approach is most applicable for co-integration analysis in this study.

Table 1
Results of Unit Root Tests

Series	ADF			ADF_GLS		
	lag	test-stat	95% BCV	lag	test-stat	95% BCV
<i>In level</i>						
LGFCF	2	-1.7339	-2.8440	2	-1.7003	-2.2845
LOFDI	4	-0.7712	-2.9361	4	-0.7932	-2.2243
LFDI ⁶	1	-3.4314*	-2.8787	1	-3.2891*	-2.2845
LGDS	4	-1.8843	-2.9361	4	-1.5730	-2.2243
<i>In first difference</i>						
Δ LGFCF	1	-11.883*	-2.9561	1	-10.932*	-2.2825
Δ LOFDI	3	-3.1585*	-2.8628	3	-5.0674*	-2.2266
Δ LIFDI	1	-7.0415*	-2.9561	1	-3.6913*	-2.2825
Δ LGDS	3	-3.3509*	-2.8626	3	-2.3353*	-2.2442

Notes: LGFCF is denoted as the log of gross fixed capital formation, LOFDI is denoted as the log of outward direct investment, LFDI is the log of foreign direct investment and LGDS is the log of gross domestic savings. * denotes the significant rejection of unit root. The 95% BCV are bootstrapped critical values by stochastic simulations using 1.000 replications. The ADF and ADF-GLS regressions include an intercept but not a trend. Optimal lags are determined using the Akaike Information Criterion.

The calculated F -statistics for the “bounds” tests are presented in Table 2, which also include the critical values for the upper and lower bounds provided by Pesaran and Pesaran (2009) (see also Pesaran *et al.* (2001) and Narayan (2005). The calculated F -statistic is 9.7633,

⁶ We also employed the Andrew-Zivot test, which incorporates structural break in the test statistic. Surprisingly, the Andrew-Zivot test does not reject the null hypothesis of a unit root for three Andrew-Zivot models, suggesting that LFDI has a unit root with a structural break (in intercept, trend or both). Hence, the unit root test for LFDI is inconclusive.

which is greater than both the upper bound critical values at 5% level of significance using restricted intercept and no trend. This implies that the null hypothesis of no co-integration can be rejected, and that there is a long-run relationship between domestic investment and its key determinants, as outward FDI, inward FDI and domestic savings.

Table 2

Bounds Test for Co-integration Analysis

Critical value (Pesaran <i>et al.</i> , 2001)	Lower Bound Value	Upper Bound Value
1%	4.385	5.165
5%	3.219	4.378
10%	2.711	3.800
Critical Value (Narayan, 2005)		
1%	4.983	6.423
5%	3.535	4.733
10%	2.893	3.983
Calculated F-statistics = 9.7633, k=3		

Note: Computed *F*-statistic: 8.8794 (Significant at 0.05 marginal values). Critical Values are cited from Pesaran *et al.* (2001) and Narayan's (2005) Table: Unrestricted intercept and no trend. K is the number of regressors.

Table 3 provides the OLS long-run estimates based on the normalized LGFCF. Since all variables are estimated in natural logarithm, the estimated coefficient of each parameter can be interpreted as a long-run elasticity. Apparently, the estimated coefficient for LOFDI (*i.e.* logged OFDI) has a negative sign.⁷ The estimation results indicate OFDI and domestic investment are substitutes, concurred the findings of Svensson (1993), Feldstein (1995), Anderson and Hainaut (1998) and Desai *et al.* (2005). However, the present study shows that LOFDI is inelastic (*i.e.* the estimated value is less than one), indicating an increase in OFDI leads to a decrease in LGFCF that is proportionately smaller. In other words, there exists a partial substitution effect of LOFDI on LGFCF such that an additional one dollar increase in cross-border direct investment by a Malaysian multinational could result in a 0.48 dollar reduction in domestic investment. On the contrary, the empirical study by Feldstein (1995) indicates that each dollar of OFDI reduces domestic investment by approximately one dollar in OECD countries and in U.S.

The estimated coefficient for LIFDI has an expected positive sign and is elastic (*i.e.* the estimated magnitude is greater than one), implying that introducing FDI-friendly policies by the Malaysian government is most instrumental in increasing LGFCF that is proportionately larger (*e.g.* a one dollar increase in FDI by a foreign multinational in Malaysia tends to encourage domestic investment by 1.83 dollar). In contrast, the

7 There was a suggestion to do some robustness check of why Malaysia outward FDI crowds out domestic investment by examining the outward FDI data by sector such as manufacturing versus services. Unfortunately, we do not have enough data points to do the robustness check. The central bank of Malaysia only reports the annual outward FDI by sector since 2008.

empirical studies by Feldstein (1995) and Desai *et al.* (2005) show that the inward FDI has insignificant effect on domestic capital formation. Moreover, LGDS tends to have a positive impact on LGFCF. The estimate of the long-run LGDS elasticity is lower relative to LIFDI, *i.e.* an additional one dollar of domestic savings leads to an increase in domestic investment by 0.86 dollar. This empirical evidence corroborates the findings by Feldstein (1995) and Desai *et al.* (2005), who found the estimated coefficient on LGDS remains large and significant, even though the estimated variable is significantly different from unity.

Table 3

Estimated Long-run Elasticities

Long-run elasticities	
Variable	Coefficient
constant	0.4735 (0.0988)***
LOFDI	-0.4845 (0.2767)*
LIFDI	1.8334 (0.5855)***
LGDS	0.8615 (0.3216)***

Notes: standard errors are in parentheses. *** and * denote 1% and 10% level of significance, respectively.

Table 4

Error-correction Model for $\Delta LGFCF$

Independent variable	Coefficient
ECT_{t-1}	-0.602 (0.105)***
$\Delta LOFDI_t$	-0.291 (0.174)
$\Delta LFDI_t$	0.444 (0.230)*
$\Delta LGDS_t$	0.382 (0.112)***
$\Delta LGDS_{t-1}$	0.511 (0.107)***
Diagnostic tests:	
R^2	0.738
Adjusted R^2	0.688
F -statistics (p-value)	20.84 (0.00)
Jarque-Bera (p-value)	0.2199 (0.896)
Ramsey's RESET: F -statistics(p-value) (2 lags)	0.000 (0.998)

Note: standard error in parentheses. * and *** denotes significant at 10% and 1%, respectively.

The empirical estimates of the error-correction model,⁸ which show the short-run dynamic adjustment of actual LGFCF to its long-run determinants are presented in Table 4. The one-lagged error-correction term ECT_{t-1} , which measures the disequilibrium between

⁸ The error-correction model is obtained through normalizing LGFCF.

the actual and equilibrium LGFCF, is statistically significant at one *per cent* level of significance and has the correct sign. According to the estimated coefficient for ECT_{t-1} , $\Delta LGFCF$ takes about 1.7 quarters (*i.e.* one divided by the estimated coefficient of ECT_{t-1}) to converge to a long-run steady state. Moreover, the estimated results suggest that the model has a reasonable good fit with robust diagnostic tests for error processes such as absence of serial correlation, normality and homodasticity. The plots of the CUSUM and CUSUMSQ tests show that the regression is stable within the five *per cent* critical bounds (see Figures 3(a) and 3(b)).

Figure 3(a)
Plot of Cumulative Sum of Recursive Residuals

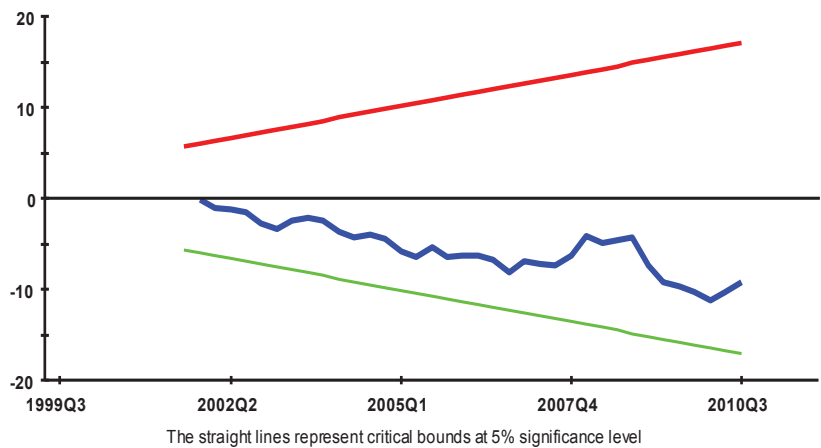
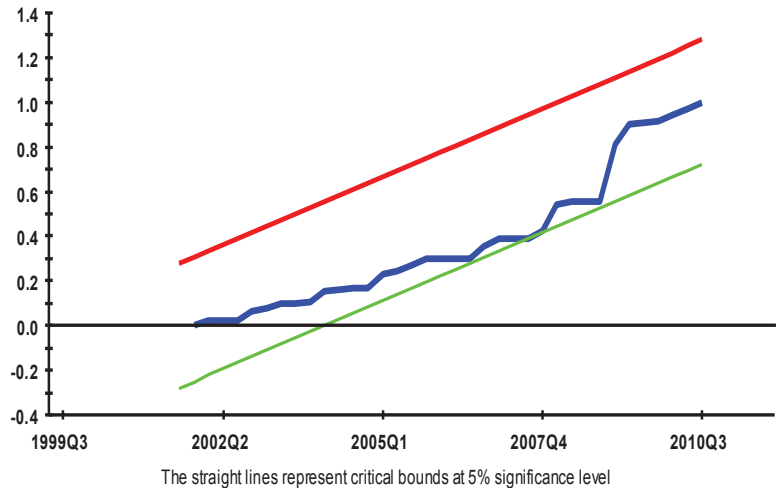


Figure 3(b)
Plot of Cumulative Sum of Squares of Recursive Residuals



4. Concluding Remarks and Policy Implications

Globalization provides a channel to encourage foreign multinationals to invest in Malaysia as well as Malaysian firms to undertake cross-border direct investments abroad. The former is instrumental in encouraging domestic investment and producing positive spillovers, while the latter facilitates the pursuit of higher profit opportunities abroad and are apt to integrate the domestic firms into global production chains to become regional and global players. The rising trend of drastic increases in Malaysia's OFDI lately alongside with sluggish private investments since the aftermath of the Asian Currency Crisis has been a main concern of the Malaysian government, in particular, whether the outbound direct investment activities from the country would detract its focus from its domestic investment activities. If it is so, what, then, are the pragmatic policies and practices that can be recommended to attract FDI so that domestic investment activities can be encouraged through the fostering of linkages between foreign multinationals and domestic firms?

Using the ARDL modelling approach to co-integration, the findings show that there is a long-run equilibrium relationship involving the four variables, *i.e.* between domestic investment and its determinants such as FDI outflows, FDI inflows and domestic savings. The sign of estimated long-run elasticity parameters reveals that the effect on domestic investment by FDI outflows is substitutional while that by FDI inflows is complementary. With reference to the magnitude of the estimated elasticity, FDI inflows is very elastic relative to FDI outflows, implying that the former can overcome the substitution effect by the latter if Malaysia is successful in attracting FDI. In an effort to attract FDI inflows, firstly, the Malaysian government ought to remove barriers to FDI by reviewing existing policies, regulations and procedures that may impinge on the high transaction costs of doing business in the domestic economy. Secondly, in order to improve the domestic investment climate, the government should continue to create opportunities and provide customised incentives for foreign investors to set their production bases in the growth corridors. Thirdly, given the prospects for rapid economic growth in the Asian region, Malaysia has the potential to foster trade linkages between countries from the East and the West by encouraging foreign MNCs to expand markets and product mix in the region through FDI in the country.

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