Outward FDI and Domestic Investment

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Abstract. This paper attempts to explore the impact of outward and inward foreign direct investment on domestic investment in Malaysia based on the theoretical model developed by Feldstein (1995) using the autoregressive distributed lag (ARDL) modeling approach. The estimated model not only can ascertain the magnitude of the long-run elasticity of the key determinants but also shed light on issues relating to substitution (complementary) effect of outward foreign direct (inward foreign direct investment) on domestic investment. The estimated long-run elasticity parameters reveal 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 inflows.

Keywords: Outward FDI, Inward FDI, Domestic Investment, Multinationals, Malaysia

1. Introduction

It is well documented in the literature that Malaysia has become an emerging source of outward foreign direct investment (OFDI) in the region (Bank Negara Malaysia, 2009; Goh & Wong, 2011; Ramasamy *et al.*, 2012). One major factor that influences Malaysian domestic firms' decision to invest abroad is the higher profit opportunities of host market relative to home market especially the former has relatively larger market size (Goh and Wong, 2011).[1] So, strategically speaking, seizing higher profit opportunities abroad and internationalizing business activities are not only instrumental in making Malaysian firms being part of the global production network but also could potentially develop themselves into regional or global players. At large, the drastic increase in Malaysia's OFDI stock from USD753 million in 1990 to USD96,758 million in 2010[2] reflect poor domestic investment opportunities causing reallocation of resources to more prospective investment opportunities abroad (Athukorala, 2009). Henceforth, the phenomenal increase of Malaysia's OFDI poses an imperative empirical question whether OFDI substitutes or complements domestic investment, which has been an important source of economic growth for the Malaysian economy over the last three decades.

The private domestic investment has been sluggish since the aftermath of the Asian Currency Crisis and it has never recovered to its pre-crisis level. Gross domestic investments dropped from a peak of 43.6% in 1995 to 19.6% in 2008 (Goh & Lim, 2010). On the other hand, outward FDI increased from US$115 million in 1992 to US$8,038 million in 2009, which led to 6,890 per cent growth over the span of 17 years. In fact, outflows of FDI exceeded inflows since 2007 that turned Malaysia into a net exporter of capital. 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.

According to Stevens and Lipsey (1992), cross-border outward direct investment can initiate the "hollowing-out" effect i.e. the relocation of domestic production when the investment opportunities abroad are relatively attractive. Hence, the economic relationship between OFDI and domestic investment is substitutional, provided multinational investment activities are not financed from external resources. In contrast, the relationship between these two variables of interest is complementary if foreign affiliates

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[1] In addition, there are other factors that motivate domestic firms to invest abroad such as efficiency seeking, resource seeking and strategic asset seeking.

[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

engage in intra-firm trade activities[3] e.g. foreign affiliates use home inputs to produce outputs in the host country (Desai *et al.*, 2005). The empirical validity of these two competing views can provide important implications for policy formulation to encourage OFDI for internationalizing business activities on one hand, and promote domestic investment on the other.

The empirical studies on the impact of OFDI on domestic investment are mixed. Utilising aggregate cross country data, Felstein (1995) found each dollar of OFDI reduced total domestic investment by approximately one dollar. Andersen and Hainaut (1998) estimated a dynamic error-correction model using annual time series data from 1960s to 1990s for Untied States, Japan, Germany and the United Kingdom. confirmed the view that OFDI tends to reduce domestic investment although the relation could differ from the one-to-one trade off. Considering a broader sample of countries with more recent data, Desai *et.al's* (2005) empirical results corroborate the pervious study by Feldstein (1995). However, using a much simpler error correction model, Herzer and Schorooten (2007) conducted a similar analysis for the United States and Germany. Their findings show outward FDI has a positive long-run effect on domestic investment. The differing evidence in above studies to some extent varies with the type of data used such as cross-country data, country- and firm-level time-series data. Moreover, a major weakness with cross-country studies is that they implicitly assume that the panel countries have similar economic structure 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.

The rest of this paper is organized as follows. Section 2 gives the specification of the model with theoretical consideration based on Feldstein and Horioka (1980) and Feldstein (1995). 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

2.1. 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 Inward FDI (IFDI) variables to explore the impact of OFDI on domestic investment. Therefore, the theoretical model in this study takes the following form:

$$GDI_t = \alpha_0 + \alpha_1 GNS_t + \alpha_2 IFDI_t + \alpha_3 OFDI_t + \varepsilon_t$$

where GDI_t is the ratio of the gross domestic investment to gross domestic product, at time t, GNS_t is the gross national savings, $IFDI_t$ and $OFDI_t$ are the ratio of outward and inward FDI with respect to gross domestic product at time t and ε is the stochastic disturbance.

The increase in domestic savings implies that more funds are available for domestic investment, therefore, α_1 is expected to be positive. Similarly, α_2 is expected to be positive because an increase in IFDI can contribute to domestic capital formation. Nonetheless, α_3 is postulated to be either positive or negative depending on whether outward FDI complements or substitutes gross domestic investment.

2.2. Data
All data are obtained from Bank Negara Malaysia's (BNM) *Monthly Statistical Bulletin.* The sample period runs from 1999Q1 to 2010Q3. The choice of this sample period is based on the availability of the data especially the FDI data. BNM has since 1999 released and published the quarterly FDI in its *Monthly Statistical Bulletin.* However, the quarterly data was not available after 2010Q4.

2.3. 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

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

(ordinary least squares) estimation of an ARDL (Autoregressive Distributed Lag) equation. As we know, one of the advantages of using the "bounds" testing approach is that it allows 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 is that this approach 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.

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.

3. Empirical Results

The F tests are used for testing the existence of long run relationship. 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 Pesan et al. (2001). 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). The calculated F-statistics for the "bounds" tests are presented in Table 1. The calculated F-statistic is 9.7633, 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, viz outward FDI, inward FDI and domestic savings.

Table 1. Bounds test for co-integration analysis

Critical value (Pesaran *et al.*, 2001)	Lower Bound Value	Upper Bound Value
1%	4.385	5.165
5%	3.219	4.378
10%	2.711	3.800
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) Table: Unrestricted intercept and no trend. K is the number of regressors.

Table 2 provides the OLS long-run estimates based on the normalized LGDI (i.e. logged of GDI). Since all variables are estimated in natural logarithm, the estimated coefficient of each parameter can be interpreted as a long-run elasticity. The estimated coefficient for LOFDI (i.e. logged OFDI) has a negative sign and is inelastic (i.e. the estimated value is less than one), indicating an increase in OFDI leads to a decrease in LGDI that is proportionately smaller. In other words, there exists a partial substitution effect of LOFDI on LGI 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. Conversely, 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 LGI 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). LGDS tends to have a positive impact on LGI, 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.

Table 2. Estimated 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)***

Note: standard errors are in parentheses. *** and * denote1% and 10% level of significance respectively

4. Concluding Remark

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. Using the ARDL modeling 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 viz 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.

5. References

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