Trade Linkages of Inward and Outward FDI: Evidence from Malaysia

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Abstract

Developing and transition economies are an increasingly important source of outward foreign direct investment (OFDI). The objective of this paper is to fill the gap in the literature regarding outward foreign direct investment by adopting the well known gravity model to examine the relationship between trade (export and import), inward and outward FDI using Malaysia as a case. This contributes to the literature as previous studies on OFDI in Malaysia have focused primarily on the determinants of these outward flows, and there are no studies examining the impact of OFDI on trade. Based on Hausman-Taylor estimation method, our findings reveal that inward foreign direct investment (IFDI) conforms to the observed pattern of a complementary relationship between FDI and trade, while OFDI and trade linkages are not significant as OFDI is dominated by the services sector, which generally is non-tradable. However, intra-firm trade in services could be increased through the process of fragmentation or outsourcing.

Keywords: Outward FDI, trade, multinationals, Malaysia

JEL classification codes: F21

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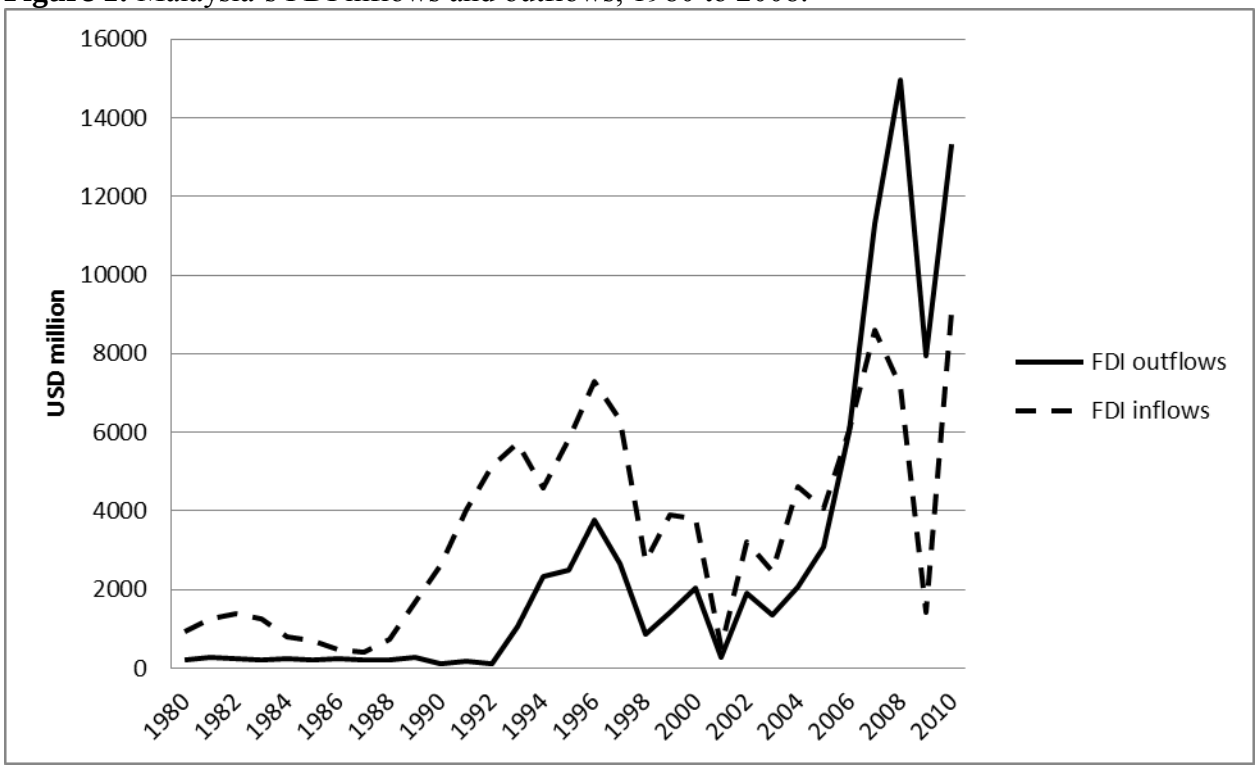
1. Introduction

In the literature, the trade effects of outward foreign direct investment (OFDI) are based primarily on the experiences of multinational enterprises (MNEs) from developed countries. However, there are some notable changes in the global OFDI landscape, namely, a shift towards services, with mergers and acquisitions (M&A) being the most common entry modes (UNCTAD 2004; 2008). This shift reflects the deregulation of services in many host countries as well as the proximity burden in services as producers and consumers generally have to be in the same locality, although there is increasing cross border tradability of some services with the use of information and communications technology (ICT). Another major change in the trend in global OFDI, as reported by UNCTAD (2011), is the increasing prominence of MNEs from developing and transition economies (DTEs) due to increasing globalization on the one hand, and falling barriers to trade and investment on the other. According to the World Investment Report 2011, outward investors from DTEs contributed 29 per cent to global FDI outflows in 2010. In particular, developing economies predominantly from Southeast Asia have become an emerging source of OFDI within and outside the region (UNCTAD, 2011). Malaysia's OFDI, as in the case of some of these developing economies, is also increasing over time (Bank Negara Malaysia 2009; Ramasamy *et al*., 2012). According to UNCTAD statistics[2], Malaysia's total approved nominal OFDI increased from US$115 million in 1992 to US$8,038 million in 2009, leading to a growth of 6,890 per cent over a span of 17 years. In fact, outflows of FDI have exceeded inflows since 2007 resulting in a shift in Malaysia's position from a net capital importer to net exporter of capital. The change in the FDI landscape was the result of the rising labour cost in the home country (Tham, 2007), the emergence of more attractive destinations for FDI in the region e.g. People's Republic of China (PRC), India and transitional economies from Indochina (see Hussain and Radelet, 2000). For instance, Goh and Wong (2011) found that the larger foreign market size was one of the key determinants of OFDI from Malaysia. Besides, other macroeconomic determinants like income, real effective exchange rate and trade openness were also positively related to Malaysia's OFDI in short and long run (Kueh *et al.* (2008)).

[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

Figure 1: Malaysia's FDI inflows and outflows, 1980 to 2008.



Source: UNCTADstat

The major impetus to the increasing outflows of capital from Malaysia can be attributed to progressive trade liberalization in the region, the search for new and expanding markets of major host countries (like the People's Republic of China), the strengthening of the ringgit against the US dollar, and the Malaysian government's liberal policy on capital outflows (Goh and Wong, 2011). However, at the same time, international trade is also an important component of Malaysia's economic structure with trade constituting 176% of the country's Gross Domestic Product (GDP) in 2010. A significant part of this trade is contributed by the multinationals operating in Malaysia and the region as Malaysia is also an important host economy, despite its declining attractiveness as a destination country for FDI since the Asian Financial Crisis (AFC). Consequently, the drastic increase in Malaysia's OFDI has raised concerns about the impact of these cross border direct investment activities on the country's trade, especially whether they promote or substitute trade since theoretically both impacts are possible (UNCTAD 2006).

Based on the investment development path (IDP) theory, the OFDI and inward FDI (IFDI) position of a country is correlated with its stage of economic development. A country thus moves from stage 1, or the "least developed stage" where the country is a net IFDI receiver to

stage five, or the "developed" stage where both inward and outward stocks of capital are about the same (Dunning and Narula 1996). Since Malaysia's inward stock of FDI in 2010 is USD101 billion while its outward stock is USD97 billion (UNCTAD 2011), it is expected that Malaysia is close to stage 4, based on this theory. This evolution is supposed to occur when local firms have acquired firm-specific advantages that allow them to engage in OFDI. But it is unclear whether the parent companies of Malaysia's OFDI will maintain linkages with their foreign affiliates through intra-firm trade as experienced by the OFDI of the developed countries.

The literature indicates that much of this depends on the motivation of the MNEs for entering a foreign market as well as industry characteristics and the tradability of the goods and services produced in that industry (UNCTAD 2006; Agarwal undated). In general, both market-seeking and efficiency-seeking OFDI may affect trade positively as affiliates may rely on the parent company for the import of capital and intermediate goods. Non-tradable services are expected to have limited trade effects. A closer examination of the sectoral distribution of OFDI in Malaysia reveals that the largest sector of OFDI is the services sector, with government-linked companies (GLCs) leading these outward flows, followed by oil and gas while the manufacturing sector takes a third place (BNM, 2009). Nevertheless, as more services are traded, process fragmentation is also emerging, with low-wage activities being sliced away and outsourced (Christen and Francois 2009), thereby raising the possibility of intra-firm trade in services.

Given the above, this paper adopts the well known gravity model to examine the relationship between trade (export and import), inward and outward FDI. This adds on to the literature on OFDI as past studies on OFDI in Malaysia have focused primarily on the determinants of these outward flows while there are no studies examining the impact of OFDI on trade (see for example Ragayah, 1999; Sim, 2005; Globerman and Shapiro 2006; Tham, 2007; Ariff and Lopez, 2008; Kueh *et al*., 2008; Goh and Wong, 2011, Wong, in press). Moreover, the literature on the impact of OFDI focuses more on the developed world rather than DTEs even though the latter economies are increasingly investing outside their home countries at an earlier stage of their development (UNCTAD 2006; Globerman and Shapiro 2006). This study aims to fill this gap. Finally, the findings of this study have implications for policy formulation and analysis for Malaysia's OFDI especially in the current wave of globalization.

The structure of this paper is as follows. Section 2 reviews the relevant literature. Section 3 specifies the model for the panel data analysis. It also describes the data and discusses the appropriate methodology to undertake this empirical study. The estimation results are reported and analyzed in Section 4 followed by conclusions and policy implications in Section 5.

2. Review of the Literature

Historically, industrialized countries are the main sources of global FDI outflows. One of the major effects of FDI is its impact on international trade. In theory, FDI may substitute or complement trade. In the early literature, Mundell (1957) used a theoretical model to demonstrate that FDI and exports are substitutes for each other. However, subsequent theoretical developments have shown that it is possible to have either a substitutionary or complementary relationship between FDI and trade, depending on the nature of the investment. Thus, for example, Markusen (1984) and Markusen and Venables (1995) showed that horizontal FDI are market-seeking or these firms expand overseas to avoid trade costs, leading to a substitutionary relationship with trade. On the other hand, Helpman (1984) and Helpman and Krugman (1985) showed the possibility of a complementary relationship when vertical FDIs are involved due to the fragmentation of the production process geographically. This results in the location of different stages of production in host economies that offer the best cost advantages for a particular stage of production.

Empirical studies on the relationship between OFDI and trade have been undertaken at different levels, viz. country level (i.e., based on bilateral trade data e.g. Grubert and Mutti (1991); Clausing, (2000)), industry level (i.e., based on cross-section data by industry e.g., Lipsey and Weiss (1981); Brainard (1997); Kawai and Urata (1998)), firm level (i.e., based on U.S. MNEs e.g., Lipsey and Weiss (1984)) as well as product level (i.e., based on disaggregated export data e.g., Blonigen (2001)). In general, there is no consensus on the trade effects of OFDI based on the empirical literature as positive and negative relationships have been found in different studies. For example, some studies supporting the proposition that OFDI is a substitute for trade are by Horst (1972), Svensson (1996), Bayoumi and Lipworth (1997) and Ma *et al.* (2000), to name a few. The findings by Horst (1972)

confirmed that OFDI is often viewed as a replacement for home exports for U.S. manufacturing firms if they were to produce for the Canadian markets. Grubert and Mutti (1991), who used bilateral trade data, however, found that OFDI from the U.S. promoted home exports and imports. Amiti *et al.* (2000) pointed out that the relationship between trade and FDI is not a straightforward one as a substitutionary relationship tends to take place if a horizontal OFDI occurs between countries that are similar in terms of relative endowments and size, and when trade costs are moderate to high. Otherwise, vertical OFDI is likely to dominate arising from intra-firm trade within the MNEs. Findings that advocate the complementary relationship between OFDI and trade are by Lipsey and Weiss (1981; 1984), Helpman (1984), Blomström *et al*. (1988), Grossman and Helpman (1989), Brainard (1993; 1997), Lin (1995), Graham (1996), Pfaffermayr (1996), Clausing (2000), Head and Ries (2001) and Hejazi and Safarian (2001). Moreover, Lim and Moon (2001) asserted that OFDI would have a positive effect on home country exports if the foreign subsidiaries were located in less developed countries, or if they were relatively new, and in a declining home industry. On the other hand, Lee *et al*. (2009) found that FDI outflows to less developed large economies like China could lead to a decrease in exports for small source countries. Furthermore, Goldberg and Klein (1999) and Bronigen (2001) showed mixed evidence in that OFDI had substitution and complementary effects on trade.

A common model used to test the relationship is an FDI-augmented gravity model[3], where inward and outward FDI are added as an additional determinant of trade (Ahn *et al*. undated). For example, the standard gravity model postulates that trade between two countries are determined positively by each country's GDP, and negatively by the distance between them. Following this study, other researchers augmented the gravity model by including population, per capital income, trade arrangement, common language, and historical and cultural ties between countries, which could potentially influence the intensity of trade between countries. The analysis is then extended to take OFDI and IFDI into account as additional determinants of trade. This will indicate whether trade and FDI are substitutes or complements after controlling for comparative advantage (Hejazi and Safarian, 2001; Ellingsens *et al.,* 2006). The gravity model has also been extensively used in the trade literature to examine several

[3] Bayoumi and Eichengreen (1997) note that " the gravity equation has long been the workshorse for empirical studies on the pattern of trade"

trade issues such as ascertaining, for example, the impact of trade liberalization, a currency union and FDI on trade flows (Frankel, 1997; Rose, 2000).

Based on the above review, we have found that the economic relationship between OFDI and trade falls into three main categories: substitution, complementary and mixed. The type of economic relationship between OFDI and trade is dependent on the domestic firms' strategies to invest abroad e.g., horizontal investment (i.e., seeking to get better access to foreign market by relocating home production to foreign production), vertical (i.e., seeking to take advantage of cheap factors of production abroad by establishing a subsidiary in the host economy) or both. However, in the case of OFDI in the services sector, which is generally market-seeking FDI, there may be limited impact on exports although it is now possible to increase efficiency by relocating certain segments of production of services.

3. Model Specification, Data and Methodology

3.1 Model Specification

The gravity model, which was developed by Tinbergen (1962) and Poyhonen (1963), in its simplest form, states that bilateral trade between two countries is directly proportional to the product of the countries' income and negatively related to the distance between them. The model has been very successful empirical mainly due to its high explanatory power in studies concerning international trade of goods (Bergstrand, 1985, 1989; Anderson and van Wincoop, 2003; Cheng and Wall, 2005).

The gravity model for the current empirical analysis can be written as:

$$\ln X_{ij} = \beta_0 + \beta_1 \ln[Y_i.Y_j] + \beta_2 \ln[P_i.P_j] + \beta_3 \ln D_{ij} + \beta_4 \ln O_{ij} + \beta_5 \ln I_{ij} + \beta_6 \ln L_{ij} + \varepsilon_{ij} \quad (1)$$

$$\ln M_{ij} = \alpha_0 + \alpha_1 \ln[Y_i.Y_j] + \alpha_2 \ln[P_i.P_j] + \alpha_3 \ln D_{ij} + \alpha_4 \ln O_{ij} + \alpha_5 \ln I_{ij} + \alpha_6 \ln L_{ij} + \varepsilon_{ij} \quad (2)$$

where

ln denotes variables in natural logs;

X_{ij} are the exports from country *i* to country *j*;

M_{ij} are the imports of country *i* from country *j*;

$Y_i.Y_j$ are the product of GDP of country *i* and *j*;

$P_i.P_j$ are the product of population of country *i* and *j*;

O_{ij} are the outward investment from country *i* to country *j*;

I_{ij} are the inward investment of country *i* from country *j*;

L_{ij} is a dummy that takes the value 1 when countries *i* and *j* speak the same language;

D_{ij} is the Great Circle distance between country *i* and *j*.

Equations (1) and (2) state that the volume of exports (*X*) and imports (*M)* between pairs of countries *i* and *j* are a function of their income or GDP (*Y*), population (*P*), distance (*D*), outward FDI (*O*) and inward FDI (*I*), and language (*L*). It is expected that income is one of the major determinants of bilateral trade because it is treated as the country's potential trade. For instance, it is considered as productive capacity for the exporting country (refer to Equation 1) and as absorptive capacity for the importing country (refer to Equation 2) (Sohn, 2005). Hence, exports and imports are positive functions of income. Similarly, exports and imports are also positive functions of population.[4] For instance, if the population of a trading partner country *j* increases, it has a tendency to increase the exports of the trading partner country *i* (and likewise for import) because a larger population of an exporting country can also be interpreted as a bigger market for imported goods as well. However, distance, which is a proxy for transaction costs (e.g. transport costs), is negatively related to both exports and imports. For instance, other things being equal, the longer the distance between two countries, the higher is the transport costs, which could in turn be an impediment to trade. In this study, we use the absolute geographical distance variable (i.e. the distance between capitals of countries) as a proxy for the economic center for a country to measure distance. With reference to the likely effects of the OFDI (or IFDI) variable on bilateral trade, it can either be complementary or substitutionary. For instance, if the foreign affiliates of domestic

[4] Bergstrand (1989), who derived the gravity equation, showed that the exports of a bilateral trade depend not only on income but also on per capita income. Per capita income represents the income level or purchasing power of exporting and importing countries. However, in view of the fact that per capita income may strongly correlate-with the income variable, the population is used as an explanatory variable instead of per capita income.

(or foreign) firms use home inputs (e.g. intermediate exports or intermediate imports) for production in host (or home) economies, then export (or import) is a positive function of OFDI (or IFDI). On the other hand, if domestic production e.g. exports of final goods and services (or imports of final goods and services) have been entirely relocated abroad (or home economy), then export (or import) is a negative function of OFDI (or IFDI). However, OFDI (or IFDI) will tend to increase import (or export) if foreign affiliates of domestic (or foreign) firms provide backward (or forward) linkages when inputs are being imported from abroad (or exported back to the home countries of foreign firms). Concerning variables such as language, this can be handled by a dummy variable, which assumes the value of one if both countries speak the same language (i.e. Malay, English and Chinese); otherwise, they take the value of zero. According to Bussiers (2006), countries sharing the same language not only tend to have lower transaction cost to trade but are also instrumental in establishing trade ties between them.

3.2 Data

The data consist of 59 countries from 1991 to 2009 and the selection of these countries is based on the availability of the OFDI and IFDI data.[5] The aggregate data for OFDI and IFDI are retrieved from the *Monthly Statistical Bulletin*, Bank Negara Malaysia (BNM). The aggregate data are chosen because both IFDI and OFDI by sectors are only available from BNM's *Monthly Statistical Bulletin* since 2008. The bilateral trade data are provided by the International Monetary Fund's *Direction of Trade Statistics* (IMF DOTs) and the Department of Statistics (DOS), Malaysia.[6] GDP as well as population are taken from the World Bank's (2009) World Development Indicators. The data on distance and language can be found from *CEPII* database.[7] All the raw data (except distance and language) are converted into real

[5] The countries (by alphebatical order) which are in our database are as follows: Australia, Austria, Bahamas, Bahrain, Bangladesh, Belgium, Bermuda, Brazil, Brunei Darulsalam, Cambodia, Canada, Chile, China, Denmark, Egypt, Fiji, Finland, France, Germany, Hong Kong, India, Indonesia, Ireland, Italy, Japan, South Korea, Laos, Lebanon, Luxembourg, Mauritius, Mozambique, Myanmar, Namibia, Netherlands, New Zealand, Pakistan, Panama, Papua New Guinea, Philippines, Portugal, Qatar, Russian, Saudi Arabia, Singapore, South Africa, Spain, Sri Lanka, Sudan, Sweden, Switzerland, Taiwan, Thailand, Turkey, United Arab Emirates, United Kingdom, United States, Uzbekistan, Vanuatu, Vietnam.

[6] It is noted that using aggregate data is prone to aggregation bias in the regression estimates as the impact of OFDI and IFDI on trade may vary at the sectoral level. However, the actual data is not available at the sectoral level. As a result, the present study is based on aggregated bilateral investment and trade data.

[7] The data on distance and language are made available in GeoDist database in CEP II. GeoDist provides several geographical variables used in Mayer and Zignago (2005), in particular different measures of bilateral distances

terms before they are transformed into natural logarithms. Appendix 1 provides a description of the variables and displays the summary statistics.

This study makes use of panel data by pooling the time series (1991 to 2009) with cross-sectional (59 countries) data. The use of panel data is appropriate in this study since we can increase the data points and the degree of freedom, thereby providing a more robust estimation.

3.3 Methodology

Earlier studies on gravity model were carried out using cross-section data. However, standard cross-section estimates of the gravity model yield biased estimates of the volume of bilateral trade because there is no heterogeneity allowed for in the regression equations (Baltagi, 2001; Egger, 2005; Chen and Wall, 2005). Panel data regression allows correction for such effect. In this study, the econometric methodology is consistent the recent development of panel data method, which explicitly takes unobserved heterogeneity into account.[8] Based on the panel data, the gravity model can be estimated by pooled ordinary least square (POLS), fixed-effects (FE), random-effects (RE), and the Hausman-Taylor (HT) methods. One caveat of the pooled regression is that it assumes homogeneity for all countries which does not permit control of the effects of the specific country. This may lead to bias estimates due to a correlation between the explanatory variables and unobservable effects (see Cheng and Wall, 2005). In contrast, the FE method introduces the country specific effect by estimating different intercepts for each pool member country. Its major benefit is that it always provides consistent estimates regardless of correlation between the specific effects and the explanatory variables. As for the RE method, which is based on Generalized Least Squares (GLS) estimator that takes time series as well as the cross-sectional dimension of the data into account, it treats intercepts as random variables across the pooled member countries. As a result, it can provide efficient estimates especially when there is little time-series variation. However, biased and inconsistent estimates are likely to occur if the specific effect is

made available for 225 countries. This database is available at http://www.cepii.fr/anglaisgraph/bdd/distances.htm

[8] We thank one of reviewers for pointing out the presence of heteroskedasticity in trade data.

correlated to some of the explanatory variables. Hence, it is necessary to test the presence of this bias by using the Hausman test, which has a χ^2 distribution under the null hypothesis of no correlation between the individual effects and the regressors. If the calculated test statistic rejects the null hypothesis, this suggests that the FE method is more efficient than the RE method. Even so, the common language dummy variable and the distance variable (that do not vary over time) as shown in Equations (1) and (2) cannot be estimated by the FE method because they will be crossed out by the fixed effect transformation.

As an alternative to both the FE and RE, Egger (2002 and 2005) proposes using the Hausman and Taylor (1981) estimator (hereafter, HT), which uses instrumental variables in lieu of the time invariant variables, and the instruments can include some of the explanatory variables in the model.[9] Egger (2005) asserts that the HT method can produce consistent and efficient estimates for the time-invariant variables if the fixed effects are not correlated with a subset of the explanatory variables.

Hausman and Taylor (1981) categorized the explanatory variables into four categories: X_{it}^1 are the variables that are time varying and uncorrelated with α_i and η_{it} ; X_{it}^2 are time varying and correlated with α_i but not η_{it}, Z_i^1 are time variant and uncorrelated and Z_i^2 are time invariant and correlated with α_i . The specification of the model is as follows:

$$Y_{it} = \beta_0 + \beta_1 X_{it}^1 + \beta_2 X_{it}^2 + Y_1 Z_i^1 + Y_2 Z_i^2 + \alpha_i + \eta_{it}$$

where α_i is the country specific component and η_{it} is the idiosyncratic error.

The correlation of X_{it}^2 and Z_i^2 with α_i is the cause of the bias in the RE estimator. The strategy proposed by HT is to use information already contained in the model to instrument for these two variables, X_{it}^2 and Z_i^2. The X_{it}^2 regressors are instrumented by the deviation from individual means (as in the Fixed Effect approach) and the Z_i^2 regressors are

[9] As pointed out by Rault *et al.* (2009), the HT estimator does not require the use of external instruments (i.e. not from the original specification of the model). Hence, the difficulties in finding suitable external instrumental variables can be avoided.

instrumented by the individual average of X_{it}^1 regressors. The model is identified when the number of X^1 is greater than the number in Z^2. In addition, there must be sufficient correlation between the instruments variables (X^1 and Z^1) and Z^2 in order to avoid a weak instrument problem. The selection of the variables that should be included in X^2 and Z^2 is not obvious. Since our objective is to address the endogeneity of inward and outward FDI with trade, we consider these two variables to be correlated with α_i. However, the product of GDP and product of population are considered to be exogenous. [10] The time-invariant endogenous variable Z_i^2 is the distance between the countries.

4. Empirical Results

The estimated results are reported in Table 2. The second and sixth columns in the table show the coefficients of the gravity model (real bilateral exports and imports) estimated by POLS. Income and distance variables are significant with the expected sign. Inward FDI is also significant but with a negative sign. Outward FDI is significant in the export equation but insignificant in the import equation. Past research has shown that if individual effects are present, then the OLS estimates could be biased. Therefore, the *F*-test is used to diagnose if all the country specific effects are equal across countries. However, the calculated *F*-statistic rejects the null hypothesis of jointly equal country specific effects and suggests the pooled regression method is inappropriate. As a result, alternative estimators such as RE, FE and HT methods, which allow for country specific effects in regression model, are considered.

The next step is to use the Breusch and Pagan Lagrange Multiplier (LM) test statistic to test if there are random effects in the FE model. The LM test statistic has a χ^2 distribution under the null hypothesis of no random effects against the alternative of random effects. The test result shows that the null hypothesis is rejected in favor of the RE model. The main drawback of the RE model is that it can result in biased and inconsistent estimates if some of the explanatory variables are correlated with the specific effect or the error term. Therefore, the Hausman test is performed to detect the presence of this bias. The calculated Hausman test statistic rejects the null hypothesis of no correlation between the individual effects and the

[10] The other reason that we incorporate the product of GDP as X^1, the exogenous time varying variable, is we found from the correlation matrix, that the product of GDP is the most correlated variable with distance, hence, provides a good instrumental variable for Z^2.

regressors, suggesting the FE model is more efficient than the RE model. But, as discussed earlier on, the FE model fails to estimate time-invariant variables such as the distance variable and the dummy variable for common language. For this reason, the gravity model is estimated by using the HT method and hence, the estimation results are reported and analyzed based on this method. The fifth and ninth columns of Table 1 present the estimation results for real bilateral exports and imports based on the HT method. Both the estimated regressions show that inward FDI, the product of GDP and distance, are key determinants of bilateral exports and imports.

< Insert Table 2 here>

The estimated coefficients of IFDI for bilateral exports as well as imports are positive and significantly different from zero, which suggests that IFDI is instrumental in providing both backward and forward linkages for Malaysia's trade i.e., the former is achieved when inputs are being imported from abroad or the home country of MNEs for value added in Malaysia, while the latter occurs when intermediate or final outputs are being produced and exported back to their home countries or affiliates elsewhere for assembly and distribution (see Sieh-Lee, 2000). This result is supported by the fact that IFDI was concentrated in manufacturing for half of the period of this study (63% from 1990-99 before falling to 41% in 2000-2009 (Bank Negara 2009)) and the importance of component trade in Malaysia as part of the regional production networks of the MNEs producing in the region. In contrast, OFDI has no significant impact on Malaysia's bilateral exports and imports. This relationship is also observed in Globerman and Shapiro's (2006) study on emerging economies. The evidence is also consistent with the fact that 70% of accumulative net OFDI from Malaysia is services based (see BNM, 2009) and this implies that these OFDI services are primarily driven by market seeking objectives. The product of GDP for bilateral exports and also imports has the largest estimated coefficient magnitude, which implies that a rapid growth of the Malaysian economy can facilitate higher export and import trade. The estimated coefficients of the distance variable, which is significantly different from zero with a negative sign, indicate that geographical distance is an important resistance factor for Malaysia's bilateral export and import trade. This suggests that trading partners located in proximity can forge higher bilateral trade for Malaysia.

5. Conclusions

This study has been motivated by the increasing importance of OFDI from DTEs, including Malaysia and the lack of studies investigating the impact of OFDI on home country trade for these countries. Malaysia represents an interesting country case study as it is a middle income economy that is relatively an important destination and source of FDI in the region. Since 2007, the economy has turned into a net capital exporter from a net capital importer. Given the importance of trade in the country, this shift warrants investigating the impact of IFDI and OFDI on the home country's international trade.

Based on the HT estimation method, our results reveal that IFDI conforms to the observed pattern of a complementary relationship between FDI and trade while OFDI and trade linkages are not significant. We attribute this result to the fact that 70% of accumulative net OFDI from Malaysia is services based (BNM, 2009) and non-tradable services are expected to have limited trade effects. In addition, it is important to note that the balance of payments data on services underestimates trade in services, especially in terms of the delivery of services in the form of natural persons, while the heterogeneous nature of services implies that a disaggregated form of analysis or study at the sectoral level may be more suitable. Unfortunately, this is not permitted based on the availability of data for Malaysia.[11] It is therefore critical to improve data collection of services to deepen the understanding of policy makers on the relationship between OFDI and trade and to provide better research support for policy formulation in the country.

The limited impact of Malaysian OFDI on trade indicates that this pattern differs from the experience of developed countries that are located in stages 4 and 5 of the IDP theory whereby it is the firm specific assets of private local firms that drive them to invest abroad in search of efficiency, or new markets or for strategic reasons. In turn, these firm specific assets create trade linkages with the home economy, thereby enabling them to benefit from outbound investment (Globerman and Shapiro 2006). Our results indicate that Malaysia has yet to follow the trajectory of developed economies in its shift from being a net capital importer to a capital exporter due to the lack of linkages between OFDI and trade. To forge

[11] The BNM only releases the IFDI and OFDI data by sector since 2008. The current data set is therefore not enough for a robust empirical analysis.

OFDI-led trade, the Malaysian government should formulate complementary policies to reinforce the trade linkages of OFDI in an increasingly competitive global economy. For instance, various measures can be used to strengthen the indigenous firms' capacity and capability so that they can meet global market requirements and compete with other global suppliers. In this way, home inputs can be sourced by both Malaysian and foreign MNCs for their respective productions abroad. In this regard, if the home-country outsourced activities are at the higher end of skilled-labor intensive industries, then the government should enhance business and technical skills training through strengthening existing training and technical training institutions and through the provision of fiscal incentives to assist new and existing indigenous firms from those industries so that they have the capabilities to provide high quality intermediate goods to both Malaysian and foreign MNCs abroad. Moreover, the home-country outsourcing activities should not exclude intra-firm trade in intermediate goods and services. Reducing tariffs and non-tariff measures that impede imports are also equally important to enhance intra-firm trade in intermediate goods and services. Hence, it is essential for the government to provide complementary trade and education policies that can support the nation's OFDI drive by deepening the integration of indigenous firms in both global and regional production networks. In this way, the country will be able to reap the potential productivity benefits of OFDI that accrue through efficiency gains from specialization and scale advantages that are garnered through the trade channels.

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Table 2: The results of OLS, FEM, REM and HTM estimation for Bilateral Export and Import of Malaysia

	Real Bilateral Export				Real Bilateral Import			
Independent variables	POLS	RE	FE	HT	POLS	RE	FE	HT
Inward FDI (IFDI)	-0.0486 (0.0244)**	0.0569 (0.0113)***	0.0586 (0.0113)***	0.0581 (0.0111)***	0.0602 (0.0347)*	0.0907 (0.0199)***	0.0835 (0.0197)***	0.0875 (0.0192)***
Outward FDI(OFDI)	0.0972 (0.0239)***	0.0027 (0.010)	0.0039 (0.0106)	0.0038 (0.0104)	0.0546 (0.0339)	0.01669 (0.0188)	0.0253 (0.0185)	0.0237 (0.0181)
Product of GDP(Y)	1.0238 (0.0443)***	0.6042 (0.048)***	0.7468 (0.0861)***	0.689 (0.0809)***	1.4667 (0.0627)***	0.4486 (0.0787)	0.6002 (0.205)***	0.5997 (0.219)***
Product of population(P)	-0.0129 (0.0355)	0.1428 (0.0882)	-0.3283 (0.2128)	-0.2613 (0.1599)	-0.1179 (0.0504)***	0.4136 (0.1322)***	0.2998 (0.121)***	0.2882 (0.101)***
Distance(D)	-1.3490 (0.0562)***	-0.9963 (0.1856)***	------	-1.826 (0.7398)***	-1.4627 (0.0796)***	-0.565 (0.270)***	------	-1.300 (0.6466)***
Language(L)	0.2352 (0.0848)***	0.2894 (0.3097)	------	0.0327 (0.6547)	0.07561 (0.120)	0.1483 (0.448)	------	0.4350 (0.9102)
Constant	-6.0793 (0.7096)***	-0.0453 (1.6680)	-9.1334 (0.9139)***	-8.4324 (6.2851)	-15.1836 (1.0057)***	-3.047 (2.460)	-3.322 (1.592)**	-4.344 (8.851)
No of Observation	630	630	630	630	630	630	630	630
R^2	0.8	0.76	0.5		0.96	0.68	0.48	
F-statistics	435.66 (0.00)				345.51 (0.00)			
Breusch-Pagan LM test		2737(0.00)				1751.7 (0.00)		
Hausman test								
FE vs RE		17.97(0.00)				51.83 (0.00)		
FE vs HT				4.2290.58)				3.11(0.538)

Note: The dependent variable is a logarithm of real export. POLS stands for the pooled OLS estimator, FE fixed effect model and RE random effect model, respectively. Countries dummies not reported here in order to save space. Figures in (.) indicate the standard error. * denotes coefficient significant at the 10% level of significance, ** denotes coefficient significant at 5% level of significance, *** denotes coefficient significant at 1% level of significance. Hausman statistic rejects the null hypothesis of correlation between explanatory variables and unobserved individual effects in all cases considered.

Appendix 1

Table1: Summary of dataset, 1991-2009

Variable	Source	Unit of measurement	Mean	Standard deviation	Maximum	Minimum
Export	IMF DOTs	Million USD	5.44	2.71	10.31	-5.4
Import	DOS, Malaysia	Million USD	4.59	3.58	10.34	-7.51
Inward FDI	Monthly Statistics Bulletin, Bank Negara Malaysia	Million USD	2.90	2.46	8.65	-2.01
Outward FDI	Monthly Statistics Bulletin, Bank Negara Malaysia	Million USD	2.74	2.07	8.16	-1.93
Product of GDP	World Bank	Million USD	22.62	2.29	28.11	16.18
Product of Population	World Bank	Million	5.75	2.12	10.52	0.13

Distance	CEP II	Kms	8.66	0.83	9.83	5.75
Language	CEP II	Dummy 1=if two trading partner share a common language 0= otherwise	0.42	0.49	1	0

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