

**The Determinants of FDI flows between the OECD and CARICOM countries**

By

Preeya Mohan  
([preeyamohan100@hotmail.com](mailto:preeyamohan100@hotmail.com))

and

Patrick Kent Watson  
([patrick.watson@sta.uwi.edu](mailto:patrick.watson@sta.uwi.edu))

**Sir Arthur Lewis Institute of Social and Economic Studies**  
**University of the West Indies**  
*St. Augustine*  
*Trinidad & Tobago*  
Tel: (868) 662-6965  
Fax: (868) 645-6329

**November 2009**

## **ABSTRACT**

The objective of this study is to determine the factors which affect Foreign Direct Investment (FDI) flows between Caribbean Community (CARICOM) and the Organization for Economic Co-operation and Development (OECD) countries. The investigation is carried out using a Gravity model applied to twenty countries - twelve CARICOM and eight OECD countries- using data covering the period 2000-2007. FDI flows more freely from high income to high income countries. They are also facilitated by the presence of a vibrant stock exchange and credit market in the investor country but are discouraged by high price levels and oppressive tax regimes in the target country as by the distance of that country from the investor country. The quantum of trade in goods does not matter but the existence of trade and service agreements between target and investor countries does.

**KEYWORDS:**

**JEL CLASSIFICATION NOS:**

## **1. Introduction**

FDI plays an increasingly important role in the global economy: flows have increased exponentially since the 1980s, rising from US\$60 billion in 1980 to over US\$600 billion per year over the period 1998-2007 (UNCTAD 2008). What is more, in 1985, OECD FDI outflows comprised 68.6% of world FDI outflows and that figure has steadily increased, now averaging 85% of world FDI outflows (OECD 2008). World FDI inflows to CARICOM countries have increased from US\$4 billion in 1980 to an average of US\$10 billion per year in the period 1998-2007. Although there has been an increase in the Caribbean's share of world FDI, inflows remain low compared to countries such as those of Asia and Latin America.

FDI inflows into CARICOM countries may have a significant impact on the output, inflation and unemployment levels in these countries. Furthermore, FDI provides a major source of capital and transfer of the latest technology which would otherwise be difficult for Caribbean countries to acquire from their domestic savings and it may be seen as a facilitating factor in growth and development. This paper is an attempt to study FDI flows between selected OECD countries and the CARICOM region.

The major challenge faced by this study was the lack of information about FDI flows among CARICOM countries. The process by which FDI statistics are recorded by all countries is by following the international standards set out by the International Monetary Fund (IMF) in its Balance of Payments manual. The OECD countries provide detailed information, explicitly stating the source and destination of all flows. This is not the case with CARICOM countries. The Central Bank of each CARICOM country is responsible for recording FDI flows with the exception of the OECS countries where the National Statistics Office carries out this function. FDI statistics can be found in the capital account of all CARICOM countries' Balance of Payments statement. However the degree of detail varies. All CARICOM countries in the study with the exception of Trinidad & Tobago simply record gross inflows and outflows. There is no information on cross country flows, that is, the data do not say where the flows come from or where they are going.

The study uses a gravity model framework to establish the determinants of international FDI flows between OECD and CARICOM countries.

The rest of the paper is organized as follows: review and synthesis of the empirical research findings regarding FDI flows, description of data and methodology used followed by results and conclusion.

## **2. Review of the Literature**

Many studies have been carried out on the benefits of FDI. The costs of FDI are also acknowledged. However, such costs may be reduced through proper economic and labour policies in host countries and a basic level of development. The OECD (2002) lists the following benefits from FDI to developing economies: technology spillovers, improved human capital formation, contribution to international trade and integration, increased competitive business environment, enhance enterprise development, all of which leads to higher economic growth which is an important tool in poverty reduction, improved environmental and social conditions through transfer of cleaner technology and more socially responsible corporate policies.

There are two types of FDI: FDI involving the acquisition of new plant and equipment in a foreign country, known as Greenfield Investment, or FDI involving the acquisition of an existing firm in the target country which is referred to as a cross border merger or acquisition. The literature generally does not distinguish between the two. Data however shows that since the 1980s most of the FDI flows were in the form of mergers and acquisitions rather than Greenfield (UNCTAD 2002). This study focuses on gross FDI outflows.

The motives for FDI investment are many and no single econometric model can take into account all the variables. The literature does indicate that economic and market factors, level of financial sophistication, trade, transactions cost, institutional /political/legal factors, geography and common culture are all significant. See Borensztein, Gregorio and Lee (1998), Cheng (2001), Trevino and Mixon (2004), di Giovanni (2005) and Hijzen et al (2007). A macroeconomic approach, such as the one followed in this paper, attempts to explain FDI behavior by examining the impact on it from economic aggregates such as national income, annual inflation and exchange rates. Previous studies examining macroeconomic variables have been done by Froot and Stein (1991) and Grosse and Trevino (1996).

Foreign investors seek markets that are large enough to support their operations and benefit from economies of scale. Real GDP can be used as a proxy for market size. UNCTAD (1994) found market size to be a primary determinant of FDI. High inflation creates uncertainty regarding the

net present value of a costly long term investment. Trevino et al (2007) study of Latin American countries confirmed that foreign companies invest less in developing countries with high inflation rates. Additionally the exchange rate can affect FDI decisions. The value of a country's currency can fall due to economic and political upheaval and monetary policy. Foreign investors incur higher costs when a host country's currency falls in value. Thus a constant real exchange rate would attract greater FDI inflows. Caribbean economies are characterized by low GDP and growth, high inflation rates but its exchange rates have remained relatively stable as most are pegged to the US dollar. In the study real GDP of the target and acquisition country were looked at and also the prevailing price level in the target country.

Financial markets are also important in affecting the investment decision of firms. Any type of investment is unable to take place without financial markets as they provide the capital needed. The stock market and the banking sector act as providers of long term capital. These are the two sources of capital looked at in this study. Caribbean economies tend to have less developed stock markets compared to OECD countries and therefore more heavily rely on private credit.

The literature also states that a 'tariff-jumping' argument can be used to explain FDI flows. Firms can enter domestic markets through exports or by setting up local production facilities. As the cost of exports increase firms are more likely to establish local production facilities. See work done by Brainard (1997), Markusen (2002), Carr et al (2001) and Blonigen et al (2003). Trade flows between countries can therefore shape FDI. If FDI acts as a substitute for trade there would be a negative relationship between FDI and trade. A stylized fact however is that FDI and trade are positively correlated. The trade coefficient can therefore be positive or negative. To further analyze the effect of trade on FDI, various regional trade agreements were looked at (di Giovanni 2005).

Distance can act to stimulate or discourage FDI. Transactions cost play a great role in a firm's FDI decision. Gordon and Bovenberg (1996) highlighted the importance of information costs of firms when undertaking investment decisions. In the international finance literature like the international trade literature such costs are assumed to increase with the geographic distance between two countries due to information asymmetries. Evidence is provided by Portes and Rey (2000), Portes, Rey and Oh (2001), and Ahearne et al (2000). In this case distance and FDI are negatively related. On the other hand transport cost from trade in good increases with distance.

In such instances firms would wish to set up operations in countries which are located far away. Hence FDI and distance would be positively related.

Besides the distance between two countries culture can influence transactions cost. One aspect of culture is language. Information can be communicated more easily if both countries share a common language and act to stimulate investment as shown by di Giovanni (2005) and Buch, Gayle and De Long (2004). There are many other factors which act as a proxy for transactions cost such as private sector regulations, bank specific and macroeconomic factors (Buch et al 2004). For practical reasons and limited data this study only considered distance and a common language in affecting transactions cost.

Another factor that can affect a firm's FDI decision is the tax rate in the host country, though it is not considered to be a main determinant. However, as the global economy becomes more competitive international investors are now increasingly comparing the tax burden of different countries (OECD 2008).

Economists have studied the relative importance of these factors in specific industries, over time and across countries. This study attempts to model FDI outflows of twelve CARCOM countries and eight OECD countries. The macroeconomic variables used were: real GDP of target and acquiring countries and the prevailing price level in the target country. Measures of financial market development in investor countries used were: market capitalization to GDP ratio and private credit to GDP ratio. Bilateral trade statistics and four dummy variables created from whether two countries share common regional trade agreements were used to investigate the impact of trade. Distance and whether both countries share a common language were used to analyze transactions cost. The impact of taxes measured by the average corporate tax rate of the target country was also looked at.

Gravity models have been traditionally used in international Economics as an empirical model in the study of bilateral trade in goods. The model assumes that trade between countries can be compared to the gravitational forces between two objects. Bilateral trade flows are directly related to the countries' size measured by their real GDPs and inversely related to the distance between them. The model also states that a log linear specification characterizes the data fairly well. Thus in estimating the model the logs of both sides are taken. GDP captures the market dimension and is expected to have a positive effect while distance acts as a proxy for transport

cost and is expected to have a negative sign. Additional explanatory variables and dummy variables can be added for further analysis. The basic model may take the following form:

$$\ln T_{ij} = \beta_0 + \beta_1 \ln Y_i Y_j + \beta_2 \ln Distance_{ij} + e_{ij}$$

where  $T_{ij}$  is gross trade flows between country  $i$  and  $j$ ,  $Y_i$  is the GDP of country  $i$ ,  $Distance_{ij}$  the physical distance between country  $i$  and country  $j$ , and  $e_{ij}$  is the error term assumed to be normally distributed with zero mean and variance equal to 1.

Pioneer studies using gravity models were done by Tinberg (1962) and Linneman (1966).

Though the models were empirically successful they were criticized for their lack of theoretical foundation. However, Anderson (1979), Deardorf (1998), Evenett and Keller (2002) and many others have justified the use of gravity models on theoretical grounds. Increasingly the model is being adopted by financial economists for the study of FDI and portfolio flows between countries. See, for example Portes and Rey (2000), Portes, Rey and Oh (2001), Flaven (2002), and di Giovanni (2003).

### 3. Data and Methodology

The gravity model used in this study augments the standard gravity model with macroeconomic, financial, trade, transaction costs and tax variables some of which takes the form of dummy variables. The specification is as follows:

$$\ln (FDI_{ij,t}) = \beta_0 + \beta_1 \ln Y_{it} + \beta_2 \ln Y_{jt} + \beta_3 \ln P_{it} + \beta_4 \ln (MC/Y^N)_{jt} + \beta_5 \ln (Credit/Y^N)_{jt} + \beta_6 \ln Dist_{ij} + \beta_7 \ln Trade_{ij,t} + \beta_8 CU_{ij,t} + \beta_9 FT_{ij,t} + \beta_{10} SA_{ij,t} + \beta_{11} Other_{ij,t} + \beta_{12} Lang_{ij,t} + \beta_{13} \ln Tax_{i,t} + e_{ij,t}$$

where  $i$  is the target country,  $j$  the investor country,  $t$  represents time and  $FDI_{ij,t}$  measures gross FDI outflows from country  $i$  to country  $j$  in year  $t$ ,  $Y$  real GDP,  $P$  the price level,  $MC$  stock market capitalization,  $Credit$  is credit provided to the private sector by bank and other non bank financial institutions,  $Y^N$  nominal GDP,  $Dist_{ij}$  the distance between the capital cities of countries  $i$  and  $j$ ,  $Trade_{ij}$  is real goods trade flow from country  $i$  to  $j$ ,  $CU_{ij}$  is a dummy variable equal to 1 if countries  $i$  and  $j$  belong to a common Customs Union,  $FT_{ij}$  is a dummy variable equal to 1 if countries  $i$  and  $j$  belong to a common Free Trade Agreement,  $SA_{ij}$  is a dummy variable equal to 1 if  $i$  and  $j$  belong to a common Service Agreement,  $Other_{ij}$  is a dummy variable equal to 1 if the target and acquiring countries  $i$  and  $j$  belong to any other type of Regional Trade Agreement,  $Lang_{ij}$  is a dummy variable equal to 1 if countries  $i$  and  $j$  share a common language,  $Tax$  is the

average corporate tax rate and  $e_{ij,t}$  is the error term assumed to be normally distributed with zero mean and variance equal to 1.

A priori, the coefficients of the following variables should be positively signed: *Y*, *MC*, *Credit* and *Lang*. *P* and *Tax* are expected to be negatively signed while the signs of all the other coefficients may be either positive or negative.

FDI data were taken from the OECD's data base, which gives FDI inflows and outflows of all OECD countries to the rest of the world in millions of US dollars for the period 2000-2007. Twenty countries were examined: the OECD countries were France, Germany, Hungary, Luxembourg, Mexico, Netherlands, United Kingdom and United States of America while the CARICOM countries were those for which data was available-Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Grenada, Haiti, Jamaica, St. Kitts & Nevis, St. Lucia, St. Vincent & the Grenadines and Trinidad & Tobago. Data for Trinidad & Tobago FDI outflows to other CARICOM countries were also included and were obtained from that country's Balance of Payments Annual Report (2008). It must be stated that the dataset is incomplete in that FDI inflows and outflows were only given for the OECD countries and Trinidad and Tobago. The data for all other CARICOM countries represent FDI outflows from CARICOM countries to OECD countries only. This limitation is acknowledged but the dataset was used because of the lack of FDI statistics among CARICOM countries (Harrison 2005).

Real GDP data were taken from the World Bank's World Development Indicators (WDI) stated in billions of US dollars with 1995 used as the base year. Price level was measured as the consumer price index in each country and the data were obtained from the International Financial Statistics (IFS) database with 2005 acting as the base year. Market capitalization data were taken from Standards and Poor's Emerging Stock Markets Fact book (2008) and was given in millions of US dollars and covered most of the countries in the study for all the years considered. Private credit data were taken from the IFS database and comprises credit provided by banks and non bank financial institutions. The data were denominated in each country's national currency and had to be converted to US dollars using the end of period national currency to US dollars exchange rate for each year considered. Exchange rate data were taken from the IFS database. Nominal GDP data were taken from the WDI denominated in millions of US dollars. The above



was then used to construct the market capitalization to GDP ratio and the private credit to GDP ratio for each year of the study.

Data on the gross bilateral trade flows among countries were compiled from two sources: the Caribbean trade (Carib trade) database and the United Nations Commodity Trade Statistics (UN Comtrade) database. The Carib trade database comprises of bilateral trade of only Caribbean countries. The UN Comtrade database was thus used to as a supplement. Information on whether both countries belong to a common Customs Union, Free Trade Agreement, Service Agreement and any other Regional Trade agreement was provided by the World Trade Organization Regional Trade Agreements database. This was used to create four dummy variables to further analyze the effects of trade. The database covers all trade agreements up to December 2008 and covers agreements which are in force but have not been notified, those signed but not yet in force, those currently being negotiated, and those in the proposal stage. It also covers all the countries in the study. Distance was taken to mean the physical distance between the capital cities and was provided by the Central Intelligence Agency World Fact Book. Information on whether two countries share a common language was also obtained from this source.

Tax data were provided by the World Tax Database created by the Office of Tax Policy Research at the University of Michigan Business. The database offers a wide range of tax rates for 150 countries. It however does not cover all the years of the study. The average corporate tax rate of the target country was used. Though this does not capture the full effects of taxes it was used to simplify the analysis.

#### **4. Results**

The gravity model was estimated by pooling the data across the twenty countries with the method of estimation being Ordinary least Squares. Table 1 below summarizes the results.

**Table 1: Summary of Results**

| Variable         | Coefficient | p-value |
|------------------|-------------|---------|
| $Y_i$            | 1.198126    | 0.0000  |
| $Y_j$            | 1.100664    | 0.0000  |
| $P$              | -5.719124   | 0.0000  |
| $(MC/Y^N)_j$     | 0.096901    | 0.0296  |
| $(Credit/Y^N)_j$ | 1.317641    | 0.0000  |
| $Dist$           | -1.788559   | 0.0000  |
| $Trade$          | -0.027167   | 0.1844  |
| $CU$             | 7.400023    | 0.0000  |
| $FT$             | 15.00556    | 0.0000  |
| $SA$             | -7.941388   | 0.0000  |
| $Other$          | -8.793793   | 0.0009  |
| $Lang$           | -2.937632   | 0.0000  |
| $Tax$            | -0.245595   | 0.0000  |

The real GDP functions as a measure of market size. The GDP coefficients were large, positive and significant for both the target and acquiring countries. Thus countries with a high GDP are more likely to be investors, and they are also more likely to invest in countries with high GDPs. Buch et al (2004) found similar results in their study of international bank mergers. The coefficient for the price level is notably large and highly significant. Firms wish to invest in countries with a low and stable price level. Financial variables appear to play a critical role in influencing FDI outflows. A 1% increase in the market capitalization to GDP ratio leads to a 0.99% outflow of FDI. Private credit appears to play an even more significant role since a 1% rise in the private credit to GDP ratio causes FDI outflows to increase by 1.32%. Similar results are obtained by di Giovanni (2005) who finds that both the market capitalization and private credit to GDP ratios to be highly significant but that the stock market played a greater role than private credit. Also, Hijgen et al (2008), who study twenty OECD countries, found that mergers are positively affected by the size of the financial markets in both the target and acquiring countries.

The trade coefficient is not significant. FDI may therefore be acting as a substitute for trade. In examining the trade dummies a common service agreement and other trade agreements

negatively impact on FDI. Alternatively a common Customs Union and Free Trade agreement positively impacts FDI. The precise impact of trade is therefore indeterminate, but it appears to be more positive than negative.

The distance coefficient was negative and highly significant. This illustrates the importance of information asymmetries across countries in deterring FDI flows rather than transport cost stimulating FDI flows. The larger apart two countries are the higher the information cost which would impact negatively on FDI. Portes and Rey (2005) investigated the hypothesis that distance can be used as a proxy for information cost which was highly significant.

The language dummy has a highly significant negative value, which is contrary to a priori expectations.

Taxes are highly significant in affecting FDI. The coefficient is negative implying that lower taxes attract greater FDI. However it must be noted that the value of the coefficient is quite low.

## **5. Conclusion**

FDI flows more freely from high income to high income countries. They are also facilitated by the presence of a vibrant stock exchange and credit market in the investor country but are discouraged by high price levels and oppressive tax regimes in the target country as by the distance of that country from the investor country. The quantum of trade in goods does not matter but the existence of trade and service agreements between target and investor countries does.

## **REFERENCES**

- Ahearne, A., Grier, W., Warnock, F., 2000. Information costs and home bias: An analysis of holdings of foreign equities, manuscript. *Federal Reserve Board, Washington DC*.
- Borensztein, E. & De Gregorio, J. & Lee, J-W., 1998. "How does foreign direct investment affect economic growth?1," *IMF Working Papers 94/110, International Monetary Fund*.
- Brainard, S.L., 1997. An Empirical Assessment of the Proximity-Concentration Trade-Off Between Multinational Sales and Trade. *American Economic Review* 87, 520-44.
- Buch, C., DeLong, G., 2004. Cross-border bank mergers: What lures the rare animal? *Journal of Banking & Finance* 28 (2004) 2077–2102.

- Carr, D.L., Markusen, J.R., Maskus, K.E., 2001. Estimating the Knowledge-Capital model Of the Multinational Enterprise. *American Economic Review* 91, 693-708.
- Deardo, A.V. 1995, Determinants of Bilateral Trade: ‘Does Gravity Work in a Neoclassical World’, *NBER Working Paper* 5377.
- Di Giovanni, J., 2005. What drives capital flows? The case of cross-border M&A activity and financial deepening. *Journal of International Economics* 65 (2005) 127-149.
- Evenett S.J. and W. Keller, 2002. On the theories explaining the success of the gravity equation, *Journal of Political Economy* 110, 281-316.
- Flavin, T. J., M. J. Hurley & F. Rousseau 2002. Explaining Stock Market Correlation: A Gravity Model Approach. *The Manchester School*, 70 (1), 87-106.
- Froot, K.A. and Stein, J. C. 1991 Exchange Rates and Foreign Direct Investment: An Imperfect Capital Markets Approach, *Quarterly Journal of Economics*, vol. 106, pp. 1,191-1,217.
- Grosse, R. & Trevino, L.J., 1996. Foreign Direct Investment in the United States: an Analysis by Country of Origin. *Journal of International Business Studies*, vol. 27, no. 1, 139.
- Hijzen, A., Gorg, H., Manchin, M., 2007. Cross-border mergers and acquisitions and the role of trade costs. *European Economic Review* 52 (2008) 849–866.
- Linnemann, H. 1966, An Econometric Study of International Trade Flows, *North Holland, Amsterdam*.
- Markusen, J.R., 2002. Multinational Firms and the Theory of International Trade. *The MIT Press, Cambridge*.
- Organization for Economic Co-operation and Development, 2002. Foreign Direct Investment for Development: Maximizing Costs, Minimizing Benefits, *CD-ROM, Paris*.
- Portes, R. and Rey, R. 2000. The determinants of Cross border equity flows. *Journal of International Economics*.
- Portes, R. Rey, R. and Oh, Y. 2001. Information and Capital flows: The determinants of transactions in financial assets *North Holland, Amsterdam*

Tinbergen, J. 1962. Shaping the World Economy. Suggestions for an *International Economic Policy*, New York.

Treviño, L, Mixon, F., 2004 Strategic factors affecting foreign direct investment decisions by multi-national enterprises in Latin America.

United Nations World Investment Report, 2002. Transnational Corporations and Export Competitiveness

United Nations Conference on Trade and Development, 2005 Expert Meeting on Capacity Building in the Area of FDI: Data Compilation and Policy Formulation in Developing Countries: by Philomen Harrison Caribbean Community, Guyana.