

**THE DETERMINANTS AND IMPACTS OF FOREIGN DIRECT INVESTMENT
ON LONG-RUN GROWTH IN JAMAICA**

By

ROBERTS, Shernett

THESIS

Submitted to
KDI School of Public Policy and Management
in partial fulfillment of the requirements
for the degree of

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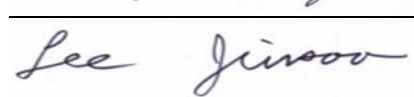
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ABSTRACT

THE DETERMINANTS AND IMPACTS OF FOREIGN DIRECT INVESTMENT (FDI) ON LONG-RUN GROWTH IN JAMAICA

By

Shernett Roberts

The aim of this study is to identify the determinants of foreign direct investment, and to further assess the impact of foreign direct investment on long-run growth in Jamaica over the period 1973 to 2010. Although Jamaica has witnessed a tremendous improvement in economic growth over the years, there is, however no conclusive evidence of this growth being linked to the increase in foreign direct investment inflows. The researcher however is not convinced that the strategies embarked upon by governments have attracted more foreign direct investment to the country than before. In analyzing the data using Ordinary Least Squares (OLS) model and Autoregressive Distributive Lag (ARDL) approach to cointegration the researcher found a mixed relationship between foreign direct investment and the macroeconomic variables analysed. Return on capital and exchange rate was found to have a negative but statistically significant influence on foreign direct investment. Gross fixed capital formation was also found to have a negative but statistical insignificant influence on foreign direct investment. Trade openness, inflation rate, government size and political party exhibited positive but insignificant influence on foreign direct investment. Political party was used as a dummy variable to capture the political climate under which economic actions are taken. The Autoregressive Distributive Lag approach to cointegration analysis revealed the presence of a long-run equilibrium relationship between foreign direct

investment and economic growth, nonetheless foreign direct investment does not have any significant effect on the growth as well as the development of Jamaica's economy during the period. The researcher therefore recommend the government to ensure stable macroeconomic policies and increase its expenditure in the area of infrastructural development as ways to accelerate the growth of Jamaican economy which will reduce the excessive dependence of Jamaica on foreign direct investment.

Keywords: Foreign Direct Investment, Economic Growth, ARDL, Cointegration, Jamaica

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INTRODUCTION

In most developing countries like Jamaica foreign direct investment (FDI) is viewed as an avenue to stimulate economic growth.¹ According to neoclassical growth theory, economic growth derived from an increase in the quantity of factors of production as well as the efficiency in their allocation.² Though developing countries like Jamaica have manpower in abundance it still lacks capital as a result of shortage in its domestic savings mobilization which places limitations on capital formation and economic development. Production on the other hand, will be constrained to shortage of foreign input (that is machines used to manufacture goods and services in developing economies) even if the supply of manpower and capital are in abundance. This as a result makes the international capital flow a critical aspect of the efforts by developing countries to close their investment that is savings gap.

Montiel and Reinhart referred to FDI as the movement of financial and human capital flows from abroad for investment in another country.³ This type of capital can be owned by a corporate body or government, and individual. According to studies, FDI is “a good cholesterol” necessary for closing the existing investment or savings gap in developing countries.⁴ In most developing countries the intervention of government is necessary to boost the economic effectiveness of FDI whenever there is a market failure. As

¹ Preeya Shalini Mohan and Patrick Kent Watson, *CARICOM Foreign Direct Investment Flows*, Sir Arthur Lewis, Institute of Social and Economic Studies, University of the West Indies (St. Augustine: Trinidad & Tobago, 2012)

² Robert M. Solow, “A Contribution to the Theory of Economic Growth,” in *Quarterly Journal of Economics*, Volume 70, No. 1 (UK: Oxford University Press, 1956), 65-94.

³ Peter Montiel, and Carmen Reinhart, “Do Capital Controls and Macroeconomic Policies Influence the Volume and Composition of Capital Flows? Evidence from the 1990s,” in *Journal of International Money and Finance*, Volume 18, (2002), 619-639. [http://dx.doi.org/10.1016/S0261-5606\(99\)00021-2](http://dx.doi.org/10.1016/S0261-5606(99)00021-2)

⁴ Ahmed E. Uwubanmwen and Mayowa G. Ajao, “The Determinants and Impacts of Foreign Direct Investment in Nigeria,” in *International Journal of Business Management*, Volume 1, No. 24 (Published by Canadian Center of Science and Education, 2012). <http://dx.doi.org/10.5539/ijbm.v7n24p67>

a result, attraction of FDI is based on the premise that greater FDI inflow will accelerate growth and development, mobilize domestic capital and improve balance of payments. Besides, FDI motivates product diversification through investments into new businesses, generates employment, increases wages and accelerates declining market sectors of the host economies.⁵

Within this view it would be reasonable to say that developing countries like Jamaica that are desirous in achieving sustainable and rapid economic growth may need to formulate and implement appropriate programmes and policies to facilitate the entrenchment of investment –friendly environments. According to Oaikhenan and Ughulu⁶ environments that are tax incentives, export promotion, correct macroeconomic policies and have a polity in which the safety of lives and property is reasonably guaranteed, is classified as investment friendly.

Efforts by several countries to improve their business climate stems from the desire to attract FDI, which include, constitutional amendment to bring sound and stable political system, privatization of public enterprises, deregularization of down oil sector, introducing a more relaxed tax system and liberalization of the telecommunications sector in conjunction with a variety of government-sponsored incentive programs. All of these and others have helped in giving FDI a human face.

Though Jamaica has witnessed a tremendous improvement in economic growth in late 1990s, we are yet to relate it to the increase in FDI inflows. As we are not convinced that the strategies embarked upon by governments have attracted more FDI to the country than before. It is against this background why there is a need for this study.

⁵ J. A. Aremu, *An Overview of Foreign Private Investment in Nigeria*, Presented at the 12th Annual Conference of the Regional Research Units, Central Bank of Nigeria, Abuja, Nigeria (2003).

⁶ H. E. Oaikhenan and S. E. Ughulu, "Foreign Direct Investment and Nigeria's Manufacturing Sub-sector: Theory and Empirical Evidence," in *West African Journal of Monetary and Economics and Statistics*, Volume 6, Issue 2 (2006), 37-54.

This paper differs from most studies because it manages to capture the political climate under which economic actions are taken. Specifically, the paper makes use of a dummy variable to account for the ruling political party during the period of examination.

The rest of the paper is organised as follows; section 2 provides a review of literature; section 3 presents the research methodology used, the empirical results and interpretation are presented in section 4 and the conclusion and policy recommendation are given in section 5.

REVIEW OF THE LITERATURE

2.1 The Determinants of FDI

Dunning's "electric theory" provided a flexible and popular framework where it is argued that FDI is determined by three sets of advantages. These advantages are based on the motives of investing firm to invest.⁷ They are, Ownership (O), Location (L) and Internalization (I) otherwise called the OLI framework.

The *location-specific advantages or resource-seeking* FDI is the presence of natural resources in host country. Resource driven FDI such as availability of low cost unskilled labour, skilled labour and quality of physical infrastructure are determinants of FDI. It was further acknowledged by Dunning that market size is the main determinant for market-seeking investors.

In addition, Asiedu argued that the main objective of market seeking FDI is to serve domestic markets, which means that goods are produced in the host country and sold in the local market.⁸ As a result, this type of FDI is driven by domestic demand such as large markets and high income in the host country. He highlighted that market-seeking FDI countries are identified by level of wages, growth and market size.

According to Kransdorff, *internalization or efficiency-seeking* FDI is primarily focused on the export market instead of the host market. This determinant of FDI is the lowest risk environment and lowest cost and includes factors such as taxes, infrastructure, and wage costs.⁹ He claimed that efficiency-seeking FDI tends to be footloose with relatively narrow margins, thus making it less reliable and less-conducive to a country's

⁷ John H. Dunning, *Multinational Enterprises and the Global Economy* (Harlow, Essex: Addison Wesley Publishing Co, 1993).

⁸ Elizabeth Asiedu, "Foreign Direct Investment in Africa: The Role of Natural Resources, Market Size, Government Policy, Institutions and Political Instability," in *World Economy*, Volume 29, Issue 1 (2006), 63-77.

⁹ Michael Kransdorff, "Tax Incentives and Foreign Direct Investment in South Africa," in *Consilience: The Journal of Sustainable Development*, Volume 3, Issue 1 (2010), 68-84.

long-term development as it is liable to leave as soon as another country offers a cheaper production environment.

Branstetter claimed that job creation in domestic economy will have different impact because of the tool used for inward FDI and the type of FDI received by a country.¹⁰ The impact of Greenfield investment on job creation he emphasized is direct as new firms require labour to operate. Kim on the other hand, identified the direct effects of inward FDI on employment as a contribution of FDI towards job creation¹¹. He further stated that the impact of attracting FDI on employment will be higher only if the FDI activities are labour intensive.

Strategic-asset seeking is another motive for inward FDI that access to research and development, innovation and advanced technology.¹²

Having outlined theorists' classification of FDI, it is important to highlight some factors that can hinder the flow of FDI into host country.

Market Size

According to Asiedu the size of the market and growth are important factors in determining the flow of FDI into host country.¹³ He further purported that studies conducted have concluded that a correlation exist between FDI and the size of the market. Other However, other studies have found GDP growth rate to be a significant explanatory variable of foreign investment decisions.¹⁴ Study by Moolman, Roos, Le Roux and Du Toit

¹⁰ Lee Branstetter, "Is foreign Direct Investment a Channel of Knowledge Spillovers? Evidence from Japan's FDI in the United States," in *Journal of International Economics, Volume 68, Issue2* (2006), 325-344.

¹¹ Young-Han Kim, "Cross-border M & A vs. Greenfield FDI: Economic Integration and its Welfare Impact," in *Journal of Policy Modeling, Volume 31, Issue 1*, (2009), 87-101.

¹² Emmanuel Cleeve, "How Effective Are Fiscal Incentives to Attract FDI to Sub-Saharan Africa?" in *The Journal of Developing Areas, Volume 8, No. 1* (2008), 135-153.

¹³ Elizabeth Asiedu, *World Economy*, 63-77.

¹⁴ Ibid.

on FDI inflow in South between 1970 and 2003, have found that the most significant determinants of FDI are openness (market size), which had both short and long term positive relationship on FDI.¹⁵ Lim on the other hand said market-seeking FDI requires a large market for efficient utilization of resources.¹⁶ He further stated that the large market reduces the cost of production because of lower fixed costs and economies of scale. Continuing he stated that as the market size of a country grows, inward FDI will increase and more goods and services can be produced.

Return on Investment

According to studies, return on investment is a main determinant of FDI due to profit motive. Carim highlighted two fundamental conditions for foreign investment which are profitability and investor confidence.¹⁷ According to him both conditions are reliant on stable political and macroeconomic policies that are consistent and transparent and help to induce economic growth and encourage investment. Greater political stability in a country will result in a higher probability of revenues appropriated by the multinational from sales made in that country. Onyeiwu noted that the profitability of investment is of primary interest to foreign investors.¹⁸ He claimed that the decision to invest in an economy, depends on the risk and return on investment in the economy. He further emphasized that capital flow into economies with low risks and high rates of return on investment. In risky

¹⁵ Christina Elizabeth Moolman, E. L. Roos; J. C. Le Roux and Charlotte Barbara Du Toit, "Foreign Direct Investment: South Africa's Elixir of life?" *University of Pretoria, Department of Economics, Working Papers* (Pretoria: South Africa, 2006)

¹⁶ David Lim, "Fiscal Incentives and Direct Foreign Investment in Less Developed Countries," in *Journal of Development Studies, Volume 19, Issue 2* (1983), 207-212.

¹⁷ Xavier Carim, "Some Trends in Foreign Direct Investment: Implications for South Africa," in *South African Perspectives, No. 34, A Working Paper Series* (Bellville: Centre for Southern African Studies, University of the Western Cape, 1994), 1-23

¹⁸ Steve Onyeiwu, "Analysis of FDI Flows to Developing Countries: Is the MENA Region Different?" *Paper presented at the ERF 10th Annual Conference* (2003)

economies, in order to attract FDI, the risk-adjusted rate of return on investment must be reasonably high.

Cost of Labour

In order to take advantage of low labour cost, investors invest in countries where costs are low.¹⁹ According to Dunning real wage rates are used as a determinant to determine the cost of labour in a host country.²⁰ He emphasized that lower wages attracts FDI. He stated that cheap labour is not the main focus besides consideration should be given to flexibility, adaptability and productivity of the labour force in the host country because it reduces costs. On the other hand, Fazekas studied the effect of wage rates on FDI in the transition countries of Eastern Europe and based on his there is strong evidence of a negative relationship between FDI inflows and wage rates.²¹ This was supported by a number of studies including that of Addison and Dunning²² and Asiedu.²³

Human Capital Availability

Human capital is another factor in determining the flow of FDI into host country. A study conducted by Rusike²⁴ to test the effects of school enrolment on FDI inflows was found that human capital and local skills are positively and significantly correlated with FDI inflows. He found that the proxy for local skills and human capital was strongly and

¹⁹ John Dunning, "Multinational Enterprises and the Global Economy, Second Edition," in *International Business Series*, (UK: Edward Elgar Publishing, 2008).

²⁰ John Dunning, *International Business Series*, (UK: Edward Elgar Publishing, 2008).

²¹ Károly Fazekas, "Effects of FDI Inflows on Regional Labour Market Differences in Hungary," in *International Economics, Volume 102, Issue 2* (2005), 83-105.

²² John Dunning, *International Business Series*, (UK: Edward Elgar Publishing, 2008)

²³ Elizabeth Asiedu, *World Economy*, 63-77

²⁴ Tatonga Gardner Rusike, "Trends and Determinants of Inward Foreign Direct Investment to South Africa," (Rhodes University, 2007).

significantly positively related to FDI inflows in developing countries. Similarly, Gelb²⁵ have found a positive correlation between secondary school enrolment and FDI. He also found that local skills have a strong determinant of FDI of which host country must reap the benefit from foreign investment.

Natural Resources Availability

Natural resources are major determinants of FDI, especially as it relates to resource seeking FDI. Study done by Asiedu on Africa, found that countries with rich endowments of natural resources tend to attract greater inflows of resource-seeking FDI.²⁶ He also found that there is strong correlation between FDI inflows and natural resources and market size. He then concluded that countries that attract more FDI are countries which are endowed with natural resources.

Additionally, a study conducted by Xolani found that South Africa is rich with natural resources, relatively low cost of doing business, relatively stable political regime and good infrastructure as compared to the rest of African economies which will result in high return on investment.²⁷ This he said gives South Africa an advantage to attract resource-seeking FDI. Dunning²⁸ noted that FDI is not always good for the host country, particularly resource-seeking FDI, because it could imply low value adding activity and low capital expenditure on plant and equipment with the exception of extractive industries.

²⁵ Stephen Gelb, "Foreign Companies in South Africa: Entry, Performance and Impact," (The Edge Institute: South Africa, 2002), 1-23.

²⁶ Elizabeth Asiedu, *World Economy*, 63-77

²⁷ Hlongwane Xolani, *The Employment Spillover of Foreign Direct Investment and Host Country Productivity*, Gordon Institute of Business Science, University of Pretoria (2011).

²⁸ John Dunning, *International Business Series*, (UK: Edward Elgar Publishing, 2008)

Political instability and Corruption

According to several researchers political instability have a negative and statistically significant impact on both foreign and domestic investment in developing countries. According to Xolani political instabilities hinder the flow of FDI into host country and that high incidence of wars and civil unrest may also increase uncertainty and therefore risk for investors.²⁹

Asiedu found that corruption has a significantly adverse effect on FDI inflows.³⁰ He also found that there is a high correlation between corruption and other explanatory variables such as political and macroeconomic stability and as a result corruption has an indirect effect as well as the direct effect on FDI flows. He argued that corruption and lack of transparent governance are key restrictions to foreign investment and that a country with high level of corruption cannot attract many investors effectively.

Government size

There is no consensus as to the relationship between government size and FDI. Evidence however, suggested that a smaller government attracts FDI while a bigger government as a result of huge spending would deter FDI.³¹ Other views indicated that high government spending particularly on infrastructure would attract FDI. Alternatively, governments could be responding to the increase in FDI from investors by expanding their expenditure, hence a positive relationship.

²⁹ Hlongwane Xolani, *The Employment Spillover of Foreign Direct Investment and Host Country Productivity*.

³⁰ Elizabeth Asiedu, "On the Determinants of Foreign Direct Investment in Developing Countries: Is Africa Different?" in *World Development Volume 30, Issue 1* (2002), 107-119.

³¹ *Ibid*, 112.

Infrastructure quality

High quality of infrastructure that is roads, airports, sea ports, supply of water and electricity as well as internet networks and telephones will attract FDI.³² It is concluded that there is a positive relationship between infrastructure quality and FDI inflow.

External debt

High level of external debt indicates inappropriate macroeconomic policies thus discouraging foreign investment. According to Onyeiwu and Shrestha countries with small debt burdens can provide basic infrastructure that is roads, telephones, electricity and water and thus attract more FDI which will indicate a negative relationship.³³

Trade Openness

As a country becomes more open, in terms of international trade transactions and more integrated with regional countries and the rest of the world, the more FDI is expected to flow to the host country. Less capital controls and liberal trade policies would encourage FDI whilst restrictive policies would deter FDI.³⁴ As in the case of South Africa, little FDI was received during the apartheid era as the country was less open to the rest of the world with a number of capital controls. The ability to move capital in and out of a country is an important consideration by foreign investors.

³² Stephen Onyeiwu and Hemanta. Shrestha, "Determinants of Foreign Direct Investment in Africa," in *Journal of Developing Societies*, Volume 20, No. 1-2 (2004), 96.

³³ Ibid.

³⁴ Ibid, 95.

Inflation

It is assumed that high inflation is negatively correlated with FDI inflows. This is emanated from the view that high inflation shows lack of monetary and fiscal discipline, thus reflecting poor macroeconomic conditions.³⁵ According to Onyeiwu and Shrestha high inflation could also increase the cost of capital which would in turn affect profitability of FDI.³⁶ They further explained that the trend of Inflation indicates that increase inflation could positively correlate with FDI. If economies are in the boom phases of their business cycles, with increasing economic growth rates and increasing FDI could find themselves with moderate increase in inflation. However as the economy expand, inflation increases not as a signal of loose monetary policy but due to economic growth taking place in the economy.

Taxes

Foreign investors consider the nature of tax laws of host countries. Onyeiwu and Shrestha³⁷ argued that high levels of taxation would discourage FDI whilst low levels of taxes would encourage foreign investors; hence there is a negative relationship with FDI. Host countries then provide a lower tax environment in an effort to attract foreign investment. However, Narula and Dunning³⁸ suggested that tax rates may not be the deciding factor in MNCs investment decisions, and that other location specific advantages may have a much greater effect.

³⁵ Ibid.

³⁶ Ibid.

³⁷ Ibid, 96.

³⁸ John Dunning, *International Business Series*, (UK: Edward Elgar Publishing, 2008)

Exchange rate

The impact of the exchange rate on FDI could happen in two ways; lowering costs of production by MNCs; and by affecting the competitiveness of the goods produced which yield profit for the foreign firms. From these perspectives, there is no consensus on the relationship between exchange rate and FDI. Lim argued that the depreciation of a currency (increase in the exchange rate) could imply that foreign firms would be able to purchase assets and technology in the host country cheaply thus increasing FDI³⁹. On the contrary, a decrease in the exchange rate, meaning an appreciation, would imply more foreign currency earnings for the foreign investors hence would increase FDI inflow.

Business environment

A business friendly environment would attract foreign investors hence attracts FDI. This however will lower the costs of doing business, such as labour regulations, lower judicial hurdles, property rights and the general macroeconomic and political environment.⁴⁰ This could also include the provision of incentives to encourage inflow of foreign investment.

An important question in most studies of FDI relates to its impact on economic growth and job creation in the host country. The section below reviews the relationship between FDI and economic growth

³⁹ Ewe-Ghee Lim, "Determinants of, and The Relation Between, Foreign Direct Investment and Growth: A Summary of the Relevant Literature," *IMF Working Paper No. 1/175* (International Monetary Fund, Washington, D. C., 2001).

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⁴⁰ *Ibid*, 13.

2.2 The Impact of Foreign Direct Investment on Economic Growth

A number of studies have been conducted on FDI and its impact on economic growth in developing countries of which the empirical findings is still not clear on this relationship. There are however, some general conclusions on this relationship. According to most literature, FDI is accepted as an avenue for sustainable growth through its positive spillover effects that is, transfer of skills and technology, job creation, improving human capital and increasing competition in developing countries.

According to Xolani inward FDI has a positive impact on economic growth of a host country through increased capital accumulation, greater efficiency, increased competitiveness, exports and access to superior technology.⁴¹ He further noted that the extent to which inward FDI positively impacts on growth depends on the quality of economic environment. In addition, Hansen and Rand,⁴² used a sample of 31 developing countries and estimators for heterogeneous panel data, found a bi-directional causality between FDI/GDP and the level of GDP. From the interpreted result, they found that FDI has an impact on GDP through knowledge transfers and adoption of new technology. Their results showed that 1% point increase in FDI leads to a 2.25% increase in GDP growth.

Blomstrom, Lipsey and Zejan established that per capita income growth in developing countries has a positive relationship with the average FDI inflows to GDP ratio.

⁴³ Borensztein, Gregorio and Lee examined the effect of FDI on economic growth in 69 developing countries and found that there is a positive correlation between growth rate and

⁴¹ Hlongwane Xolani, *The Employment Spillover of Foreign Direct Investment and Host Country Productivity*, Gordon Institute of Business Science, University of Pretoria (2011).

⁴² Henrik Hansen and John Rand, "On the Casual Links between FDI and Growth in Developing Countries," in *The World Economy*, Volume 29, Issue 1 (2006), 21-41.

⁴³ Magnus Blomstrom, Robert E. Lipsey and Mario Zejan, "What Explains Developing Country Growth?" *NBER Working Paper 4132*, (Cambridge, MA: National Bureau of Economic Research, 1992).

FDI.⁴⁴ Their study showed that the contribution of FDI in economic growth depends on the capacity of assimilation of technology by the host countries. In fact, the intensity of the positive relationship between FDI and growth is largely determined and correlated to the quality of human capital. However, once the human capital of a host country has reached the optimal threshold, FDI becomes more productive than domestic investment.

In addition, Chowdhury and Mavrotas produced empirical evidence on the relationship between FDI and economic growth which was obtained from a single-equation and simultaneous equation estimates for 140 countries using macro-economic variables. Their results indicated a positive and statistically significant estimate of coefficient of FDI and economic growth.⁴⁵

De Mello⁴⁶ and OCED⁴⁷ acknowledged that the impact of FDI on growth depends on the economic and technological conditions which exist in host countries. Therefore, developing countries must achieve a certain level of education and infrastructure development before they become capable of making the best use of the potential benefits associated with FDI. As a consequence, FDI seemed to have more limited effects on growth in technologically less advanced countries. The main result of the study by the OECD⁴⁸ is that a strong link seems to exist between FDI and growth. Although this relationship is largely heterogeneous across countries, the general consensus is that on average, FDI has an impact on growth in the context of causality in the sense of Granger.

⁴⁴ Eduardo Borensztein, Jose De Gregorio and Jong-Wha Lee. "How Does Foreign Direct Investment Affect Economic Growth?" in *Journal of International Economics*, Volume 45(1998), 115-135.

⁴⁵ Abdur Chowdhury and George. Mavrotas, "FDI and Growth: A Casual Relationship," in *UNU-WIDER Research Paper No. 2005/25*, UNU-WIDER (2005).

⁴⁶ Luiz R. de Mello Jr., "Foreign Direct Investment in Developing Countries and Growth: A Selective Survey," in *Journal of Development Studies*, Volume 34, Issue 1 (1997), 1–34.

⁴⁷ OECD (2002), *Foreign Direct Investment for Development. Maximising Benefits, Minimising Costs: Overview*. (Paris: OECD Publications, 2002).

⁴⁸ Ibid.

De Mello, on the other hand, found a less uniform FDI impact on economic growth in a group of industrialized and developing countries.⁴⁹ The study concluded that the growth promotion effects of FDI depend on the relationship between FDI and domestic investment. Zhang analysed the impact of FDI on economic growth in China using panel data techniques.⁵⁰ This study illustrated the transmission channels through which FDI causes positive as well as negative impacts on growth. With the help of provincial data from the inland and coastal areas of China covering the period 1992–2004, the author found that FDI has positive impacts on growth, and that these impacts are more robust in China’s coastal areas. Focusing on Ireland, Kim and Bang analysed the link between FDI and economic using annual time-series data for the period 1975–2006 and the autoregressive distributed lag (ARDL) approach, to find a long-term relationship between FDI and economic growth.⁵¹ The study’s empirical results show FDI’s statistically significant impacts on growth in both the short and long terms. The results of the Granger causality test indicated that FDI causes economic growth. Moreover, FDI helped to create job opportunities in host countries and complements domestic financial resources. Athukorala examined the effects of FDI on economic growth indicators in Sri Lanka using cointegration and an error correction model (ECM), as well as annual timeseries data for the period 1959–2002.⁵² The author arrived at results that are somewhat ambiguous, because the net effect of FDI on growth is not strong enough due notably to corruption, bad laws, and a poor governance structure.

⁴⁹ Luiz R. de Mello Jr., “Foreign Direct Investment-Led Growth: Evidence from Timeseries and Panel Data,” in *Oxford Economic Papers*, Volume 51, Issue 1 (1999), 133-51.

⁵⁰ Kevin H. Zhang, “Foreign Direct Investment and Economic Growth in China: A Panel Data Study for 1992-2004,” *Paper presented at the Conference of WTO, China and Asian Economies, University of International Business and Economics, 24-26 June* (Beijing: China, 2006)

⁵¹ Kyuntae Kim and Hokyung Bang, “The Impact of Foreign Direct Investment on Economic Growth”: A Case Study of Ireland,” KIEP Working Paper 08-04, (Seoul: Korea Institute of International Economic Policy, 2008).

⁵² P.P.A Wasantha Athukorala, “The Impact of Foreign Direct Investment for Economic Growth: A Case Study of Sri Lanka,” *International Conference for Sri Lanka Studies*, 2003.

In light of the above literature, it is clear that the impact of FDI on economic growth seemed to be country based and it can either be positive, negative or inconclusive depending on the economic conditions of each country. It is also due to different methodologies and samples used by different researchers. The next section provided the methodology and research results.

RESEARCH METHODOLOGY

3.1 Data Collection and Source

The objective of this paper is to explore the casual nexus between FDI and economic growth in Jamaica using annual time series data for the period 1973 to 2010. The variables of interest for this study are economic growth and FDI. Real Gross Domestic Product (GDP) per capita is used as the proxy for economic growth in Jamaica. Data for the sample period were obtained from the World Bank (WB), the International Monetary Fund (IMF) and the Bank of Jamaica (BOJ). The study aims to examine the long-run and casual dynamic relationships between the levels of FDI flowing into Jamaica and economic growth.

To examine the long-run equilibrium as well as the short-run dynamics of the proposed FDI model we first establish the stationarity of the selected variables. The result revealed that variables are not stationary at same order, so we relied on a cointegration technique named Autoregressive Distributive Lag (ARDL) which was developed by Pesaran, Shin and Smith.⁵³ ARDL approach not only long-run and short-run cointegration among the variables but also the short-run dynamics named Error Correction Method (ECM).

3.2 Model Specification and Estimation

Using a bi-directional approach we seek to find the relationship between Foreign Direct Investment (FDI), Gross Domestic Product (GDP), Government Size (GOVSIZE), Trade Openness (OPEN), Inflation Rate (INF), Return on Capital (INT), Gross Fixed Capital Formation (FIXCAP), Exchange Rate (FX) and Political Party (POL_PARTY) with

⁵³ M Hashem Pesaran, Yongcheol Shin and Richard J. Smith, "Testing for the 'Existence of a Long-run Relationship'," *Cambridge Working Papers in Economics* 9622, Faculty of Economics, University of Cambridge (1996).

emphasis on the determinants of FDI and its impact on economic growth in Jamaica. The estimated equation is as follow:

$$FDI_{t-1} = \beta_0 + \beta_1 \Delta GDP_{t-1} + \beta_2 \Delta INT_{t-1} + \beta_3 INF_{t-1} + \beta_4 \Delta GOVSIZE_{t-1} + \beta_5 \Delta OPEN_{t-1} + \beta_6 \Delta FIXCAP_{t-1} + \beta_7 \Delta FX_{t-1} + \beta_8 \Delta POL_PARTY_{t-1} + \varepsilon_t \dots\dots\dots(1)$$

- Where:
- β_0 , is the drift component
 - ε_t , the white noise error term
 - Δ , the first difference operator
 - POL_PARTY, dummy variable

3.3 Variables Description

The data analyzed for this study are significant in the attraction of FDI inflows as well as their impact in Jamaica over the years. The data defined are as follows:

- (a) *The Gross Domestic Product (GDPCAP)*: This denotes market size, which is indicative of the level of economic activity. It is used to measure the impact of foreign investment in host countries.
- (b) *Foreign Direct Investment (FDI)*: The net inflow of capital investment made to acquire lasting interest in a firm operating in another country other than that of investors' country.
- (c) *Trade Openness (OPEN)*: This is a percentage of imports and exports to a country's GDP.
- (d) *Government size (GOVSIZ)*: This is a percentage of government consumption to GDP, which is expected to have a positive relationship on economic growth and FDI.
- (e) *Return on Capital (INT)*: This is interest rate paid on deposits by banks in Jamaica.

(f) *Inflation Rate (INF)*: This is a proxy of the macroeconomic stability.

(g) *Exchange Rate (FX)*: This measures the value of a country's currency in terms of another country's currency. This variable captures the macroeconomic instability effect.

(h) *Gross fixed capital formation (FIXCAP)*: This variable is used as a proxy for infrastructure and includes land improvements, plant, machinery and equipment purchases, the construction of roads and railways, schools, offices, hospitals, private residential dwellings as well as commercial and industrial buildings.⁵⁴

(i) *Political party (POL_PARTY)*: This variable is used as a dummy variable to capture the economic condition in Jamaica.

3.4 Hypotheses

(a) *The Gross Domestic Product (GDPCAP)*: Gross Domestic Product is the level of development and the wealth of a country, the size of the local market is one of the most important and relevant factors to explain the flows of FDI. When there is a large market size, business environment will be prosperous and thus will attract foreign investors.

Hypothesis: There is a positive and significant relationship between gross domestic product and inward FDI.

(b) *Trade Openness (OPEN)*: Trade Openness deals with the trade restrictions that are placed on goods and services coming into a country. When a country is open to trade with other countries it is expected that there will be more FDI coming into that country. This is because trade openness promotes free trade which encourages more investment.

Hypothesis: There is a positive and significant relationship between trade openness and inward FDI.

⁵⁴ The World Bank, *Gross Fixed Capital Formation (Current US\$)*, The World Bank (2013).

(c) *Government size (GOVSIZ)*: Government size assesses a country's government consumption expenditure. The higher the level of government consumption the more it will be translated into the provision of social infrastructure which will encourage production, growth and FDI.

Hypothesis: There is a positive and significant relationship between government size and inward FDI.

(d) *Return on Capital (INT)*: This is interest rate paid on deposits by banks in Jamaica. Countries that pay higher return on capital will have increased FDI inflow, which is indicative of a higher level of productivity and economic growth.

Hypothesis: There is a positive and significant relationship between return on capital and inward FDI.

(e) *Inflation Rate (INF)*: Inflation rate assesses a country's economic strengths and weaknesses. The higher the inflation rate, the less conducive is the economic climate for investments, as more time, money and energy are needed by investors to adjust to rising price level.

Hypothesis: There is a negative and significant relationship between inflation and inward FDI.

(f) *Exchange Rate (FX)*: Exchange rate assesses a country's financial health and strength. The sign for exchange rate is inconclusive but reference stated that unexpected movements in the exchange rate may affect expected rates of return to investment, which has an impact on FDI flows into developing countries.

Hypothesis: There is a negative and significant relationship between exchange rate and inward FDI.

(g) *Gross fixed capital formation (FIXCAP)*: Gross fixed capital formation assesses a country's infrastructure. When a country has good infrastructure, the transportation of

goods becomes more efficient, increase in communication through the use of technology, uninterrupted power and water supplies.

Hypothesis: There is a positive and significant relationship between gross fixed capital formation and inward FDI.

(h) *Political party (POL_PARTY):* Political party measures a country’s political stability. The political status in a country is an important consideration for foreign investors.

Hypothesis: There is a negative and significant relationship between political party and inward FDI.

3.5 Unit Root Test for Stationarity

Researchers Gujarati and Porter indicated that tests such as F-statistics, t-statistics and R^2 are not applicable in a non-stationary time series by reason of non-standard distributions.⁵⁵ Further indication is that a stationarity or unit root test is to be carried out to test the order of integration. The Augmented Dickey-Fuller (ADF) test was used to test the order of integration which follows three (3) sequences:

$$\text{With constant and trend } (t_t) \quad \Delta Y_t = \alpha + \beta t + \delta Y_{t-1} + \mu_t \dots \dots \dots (2)$$

$$\text{With constant only } (t_u) \quad \Delta Y_t = \alpha + \delta Y_{t-1} + \mu_t \dots \dots \dots (3)$$

$$\text{Without constant and trend } (t) \quad \Delta Y_t = \alpha + \delta Y_{t-1} + \mu_t \dots \dots \dots (4)$$

The ADF test for stationarity showed variables stationary at level form and first differenced. If the test is significant at the 5% significance level, it means that there is stationarity among variables and that variables do not have any unit root. In this case we will reject the null hypothesis and accept alternative.

⁵⁵ Damodor N. Gujarati and Dawn C. Porter. *Basic Econometrics, 5th Edition*. McGraw-Hill/Irwin (2009).

Relating to the above, Model *with constant and trend* (t_i) has a drift and a deterministic time trend. However, Model *with only constant* (t_i), has a drift and Model *without constant and trend* (t) has no drift or deterministic time trend.

3.6 Cointegration Test

Cointegration is another way to overcome the problem of non-stationarity. Cointegration is based on the premise that two or more non-stationary variables, which have a long-run relationship, will give stationary results for a linear combination of variables when regressed on each other.⁵⁶ Once the null hypothesis is rejected, we therefore accept the alternative hypothesis and conclude that cointegration exists.

3.7 The Autoregressive Distributed Lag (ARDL) Model

Several econometric methods have opted to investigate the long-term equilibrium between variables including the methods developed by Engle and Granger,⁵⁷ Phillips and Hansen,⁵⁸ and Johansen,⁵⁹ but for the purpose this study the autoregressive distributed lag (ARDL) approach to cointegration is used achieve the study objectives.

The advantage of the ARDL modeling approach is that it can be applied without taking into account the fact that regressors are I(1) or I(0) and also the that fact regressors

⁵⁶ Ibid.

⁵⁷ Robert F. Engle and C. W. J. Granger, "Cointegration and Error Correlation: Representation, Estimation and Testing," in *Econometrica*, Volume 55, No. 2 (The Econometric Society, 1987), 251-276.

⁵⁸ Peter C. B. Phillips and Bruce E. Hansen, "Statistical Inference in Instrumental Variables Regression with I(1) Processes," in *The Review of Economic Studies*, Volume 57, No. 1 (UK: Oxford University Press, 1990), 99-125.

⁵⁹ Soren Johansen, "Statistical Analysis of Cointegration Vectors," in *Journal of Economic Dynamics and Control*, Volume 12, Issue 2-3 (June – September), 231-254.

are endogenous.⁶⁰ As a result, this approach makes it possible to bypass unit root tests at the outset of the empirical analysis. The ARDL-error correctional model is as follows:

$$\Delta GDP_t = \beta_0 + \sum_{i=1}^p \beta_{1i} \Delta GDP_{t-1} + \sum_{i=0}^p \beta_{2i} \Delta FDI_{t-1} + \sum_{i=0}^p \beta_{3i} \Delta INT_{t-1} + \sum_{i=0}^p \beta_{4i} \Delta FIXCAP_{t-1} + \sum_{i=0}^p \beta_{5i} \Delta POL_PARTY_{t-1} + \lambda_6 \Delta GDP_{t-1} + \lambda_7 FDI_{t-1} + \lambda_8 \Delta INT_{t-1} + \lambda_9 \Delta FIXCAP_{t-1} + \lambda_{10} \Delta POL_PARTY_{t-1} + \varepsilon_t \dots \dots \dots (5)$$

Where, β_0 , is the drift component; ε_t , the white noise error term; Δ the first difference operator; p the optimal lag length; $\beta_1, \beta_2, \beta_3, \beta_4$, and β_5 , represent the short run dynamics of the model whereas $\lambda_6, \lambda_7, \lambda_8, \lambda_9$ and λ_{10} are the long run elasticities.

The long-run elasticity between the FDI inflow and its determinants can be examined through the formal procedure of computing the F-statistics. The F-statistics includes the alternative H1: $\lambda_6 \neq \lambda_7 \neq \lambda_8 \neq \lambda_9 \neq \lambda_{10} \neq 0$ hypothesis is if there exists a long-run cointegration or long-run relation between the variables.

The ARDL model can be generalized to allow each independent variable to have different speeds of adjustment. Before running the ARDL model we tested the level of integration of all variables because if there exist a variable at I(2) or above, then the ARDL approach will not be applicable. For this we used the Augmented Dickey-Fuller test (ADF) and the Philips–Perron (PP) test.

To find the long run relationship in the equation above, we used the bound test approach (F-test with two bounds that is, lower and upper bounds). The result of the null hypothesis assumed no cointegration among variables. However, if the value of F-statistic is greater than upper bound then the null hypothesis is rejected, and if it is less than the lower and upper bounds then the null hypothesis is accepted but if it falls between the lower bounds the test is considered inconclusive.

⁶⁰ Richard Harris and Robert Sollis, *Applied Time Modelling and Forecasting*, (Chichester: Wiley, 2003)

If there exist long-run relationship between variables, then there also exists an error-correction representation. Consequently, the error-correction model indicates the speed of adjustment to long-run equilibrium following s short-run shock.

A general error-correction representation of equation (5) is formulated below:

$$\Delta GDP_t = \beta_0 + \sum_{i=1}^p \beta_{1i} \Delta GDP_{t-1} + \sum_{i=0}^p \beta_{2i} \Delta FDI_{t-1} + \sum_{i=0}^p \beta_{3i} \Delta INT_{t-1} + \sum_{i=0}^p \beta_{4i} \Delta FIXCAP_{t-1} + \sum_{i=0}^p \beta_{5i} \Delta POL_PARTY_{t-1} + \lambda ECT_{t-1} + u_t \dots \dots \dots (6)$$

Where, λ is the speed of adjustment parameter, and ECT is the residuals derived from the estimation of the cointegration model given in equation (5).

To check true dynamics of the estimated model we use Akaike Information Criteria (AIC) or Schwarz Bayesian Criteria (SBC) to get an optimal lag length of the variables. The paper also conducted the stability tests, namely, Cumulative Sum (CUSUM) and CUSUM of Squared (CUSUMSQ) of recursive residuals which was originally proposed by Brown, Durbin and Evans.⁶¹

⁶¹ R. L. Brown., J. Durbin, and J. M. Evans, "Techniques for Testing the Constancy of Regression Relations Over Time," in *Journal of the Royal Statistical Society, Volume 37, No. 2* (1975), 149–163.

EMPIRICAL RESULTS AND INTERPRETATION

4.1 Unit Root Tests for Stationarity

Before carrying out the ARDL bounds test, we first test for the stationarity of all the variables in the model to determine the order of integration for each variable. This is a necessary step to ensure that variables are not second-order stationary i.e. I(2) and also to avoid fallacious results. According to Ouattara⁶², the calculated F-statistics claimed by Pesaran, Shin and Smith⁶³ are not valid in the presence of I(2) variables, since the bounds tests are based on the assumption that variables are either I(0) or I(1). Consequently, the use of unit root tests in the ARDL procedure is still needed to ensure that none of the variables are integrated of order 2 or beyond.

Table 1: Augmented Dickey-Fuller (ADF) Unit Root Tests Results

| Variables | Level | | First Difference | | Conclusions |
|-----------|-----------------------|--------------------|-----------------------|--------------------|-------------|
| | Constant and No Trend | Constant and Trend | Constant and No Trend | Constant and Trend | |
| FDI | -4.553985** | -4.800833** | | | I(0) |
| GDPCAP | -3.626580 | -3.533195 | -8.947660** | -9.025447** | I(1) |
| FIXCAP | -1.654432 | -2.083974 | -6.153326** | -6.087691** | I(1) |
| FX | 1.684304 | -1.645383 | -5.705608** | -6.713947** | I(1) |
| OPEN | -3.278706 | -3.127879 | -6.006496** | -5.995294** | I(1) |
| GOVSIZE | -1.727003 | -1.262024 | -4.505119** | -4.491656** | I(1) |
| INT | -2.375838 | -2.257439 | -5.497673** | -5.588432** | I(1) |
| INF | -3.729315** | -3.782403** | | | I(0) |
| POL PARTY | -1.658265 | -1.619331 | -5.885704** | -5.808600** | I(1) |

Note: **indicates stationarity at the 5% level.

Source: Eviews 7

The result of the stationarity tests presented in Tables 1, showed that variables

⁶² Bazoumana Ouattara, "Aid, Debt and Fiscal Policies in Senegal," in *Journal of International Development*, Volume 18, Issue 8 (2006), 1105-1122

⁶³ M. Hashem Pesaran, Y. Shin and R. J. Smith, "Bounds Testing Approaches to the Analysis of Level Relationships," in *Journal of Applied Econometrics*, Volume 16, Issue 3 (2001), 289-326.

retained the order of either I(0) or I(1). According to Perron⁶⁴ in the presence of structural changes, the power of the conventional unit root tests to reject the unit root hypothesis decreases. In this case, the Phillip-Perron test is used to test for the stationarity variables in the presence of structural changes. The results are presented in Table 2. From this test we can see that the variables retained in the model are either I(0) or I(1) as in the presence ADF test.

Table 2: Phillips-Perron (PP) Unit Root Test Results

| <i>Variables</i> | <i>Level</i> | | <i>First Difference</i> | | <i>Conclusions</i> |
|------------------|------------------------------|---------------------------|------------------------------|---------------------------|--------------------|
| | <i>Constant and No Trend</i> | <i>Constant and Trend</i> | <i>Constant and No Trend</i> | <i>Constant and Trend</i> | |
| FDI | -4.553985** | -4.785717** | | | I(0) |
| GDPCAP | -3.535801 | -3.432464 | -9.074896** | -9.172994** | I(1) |
| FIXCAP | -1.692566 | -2.179896 | -6.150974** | -6.086182** | I(1) |
| FX | 1.914758 | -1.592001 | -5.703706** | -6.709935** | I(1) |
| OPEN | -3.366783 | -3.240830 | -6.199963** | -6.173292** | I(1) |
| GOVSIZE | -1.375097 | -1.502844 | -4.511265** | -4.493532** | I(1) |
| INT | -2.556401 | -2.469768 | -5.169466** | -5.138703** | I(1) |
| INF | -3.724377** | -3.784055** | | | I(0) |
| POL PARTY | -1.720547 | -1.682370 | -5.885684** | -5.808585** | I(1) |

Note: **indicates stationarity at the 5% level.

Source: Eviews 7

Concluding that the orders of integration of the variables retained in the model are either 0 or 1, we can confidently apply the ARDL bounds tests to our model.

4.2 Cointegration Results

In Table 3 below, the computed value of the F-statistics of the joint null hypothesis showed that there is no long-run relationship between the variables at 7.774555 which is greater than the upper bound (4.378) of the 95 percent critical value (3.219 – 4.378) which helps us to reject the null hypothesis that there is no long- run relationship between the

⁶⁴ Pierre Perron, “The Great Crash, the Oil Price Shock, and the Unit Root Hypothesis,” in *Econometrica*, Volume 57, No. 6 (The Econometric Society, 1989), 1361-1401.

variables but there is evidence of cointegration or long-run relationship between GDPCAP, FDI, INT and FIXCAP.

Table 3:F-Statistics resulting from the Existence of Long-run Relationship between variables

| | |
|-------------------------------------|--------------------------------|
| Computed F-Statistic | 7.774555** |
| Bound Testing Critical Values at 5% | 3.219 (Lower) 4.378 (Upper) |

Note: The critical values are taken from Pesaran and Pesaran⁶⁵ intercept and no trend with four regressors. The range of the critical value at 1% and 10% are 4.385 – 5.615 and 2.711 – 3.800 respectively.

Source: E-views 7

4.3 Determinants of FDI Results

Table 4: OLS Regression Results

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|--------------------|-------------|------------|-------------|-----------|
| C | -2.429052 | 1.882040 | -1.290648 | 0.2078 |
| FDI(-1) | 0.301727 | 0.155805 | 1.936568 | 0.0633* |
| GDPCAP | 0.103058 | 0.079878 | 1.290189 | 0.2079 |
| INTD1 | -0.062261 | 0.016357 | -3.806491 | 0.0007*** |
| POL_PARTY | 0.669764 | 0.478356 | 1.400138 | 0.1729 |
| OPEN | 0.029619 | 0.019417 | 1.525375 | 0.1388 |
| INFD1 | 0.006489 | 0.015207 | 0.426692 | 0.6730 |
| FXD1 | -0.161399 | 0.074913 | -2.154502 | 0.0403** |
| GOVSIZED1 | 0.042961 | 0.217266 | 0.197736 | 0.8447 |
| FIXCAPD1 | -0.171952 | 0.112347 | -1.530544 | 0.1375 |
| R-squared | 0.466108 | | | |
| Adjusted R-squared | 0.288145 | | | |
| S.E. of regression | 1.334382 | | | |
| Durbin-Watson stat | 2.123605 | | | |
| F-statistic | 2.619118 | | | |
| Prob(F-statistic) | 0.025534 | | | |
| Observation | 37 | | | |

Note: significance p-value at ***1%, **5% and *10%.

Source: Eviews 7

In Table 4 above it can be noticed that foreign direct investment (FDI) is statistically significant and positively correlated with the rate of growth. GDPCAP are positive but statistically insignificant in determining FDI inflows. This is not consistent

⁶⁵ M. Hashem Pesaran and Bahram Pesaran. *Microfit 4.0* (Oxford: Oxford University Press, 1997).

with the research hypothesis stated in chapter one and also the literature review in chapter two that there exists a positive relationship between FDI and GDP. A possible explanation for this is that international firms that invest in the local country are not primarily looking for market shares in the host country but are trying to minimize their costs of production factors. The coefficient for GDPCAP suggested that a one unit increase GDPCAP will increase results in a 0.103058 unit increase in FDI flows.

Return on capital (INT) has a negative but significant relationship with FDI at the 1% level. The coefficient of INT indicated that a unit decrease in INT will decrease FDI inflows by -0.059923 units. This however is not consistent with our research hypothesis in chapter one and the literature review stated in chapter 2, that high return on capital will increase the flow of FDI. Nevertheless, high investment rate leads to high return on capital, and low when return on capital is low, suggesting that investment rate is significantly affected by return on capital. This shows that return on capital is affected by the economic cycle; however, it follows a decreasing trend in the long run because it is affected by labour's share and capital-output ratio.

Exchange rate (FX) has negative and significant relationship with FDI at the 5% level, this means that a fall in the exchange rate of a country we are trading with is a major boost for foreign direct investment inflow. This is because it takes less amount of foreign exchange from parent company to invest in a host country. This is consistent with literature in chapter 2 that there is no consensus on the relationship between exchange rate and FDI. The coefficient OF FX suggested that a percentage decrease in FX will decrease FDI inflows by -0.171952 percentages.

There is no correlation between FDI and INF, which means that INF does not bring any change in FDI inflow. The higher the inflation rate the less conducive is the economic climate for investment, as more time, money and energy are needed by investors to adjust

to the rising price level. This however is not consistent with the literature in chapter 2 that high inflation would be negatively correlated with FDI inflow.

Openness has the expected positive sign but found to be statistically insignificant in the impact of FDI inflow. This result revealed that in Jamaica there still exist barriers to trade such as quotas, abusive tariffs customs and police harassment despite the numerous efforts of economic liberalization initiated by the Jamaican government. According Onyeiwu and Shrestha less capital controls and liberal trade policies would encourage FDI whilst restrictive policies would deter FDI.⁶⁶

Gross fixed Capital formation (FIXCAP) a proxy for infrastructure showed no correlation between FIXCAP and FDI inflow. This however is not consistent with research hypothesis and literature in chapter 2 that there expect to be a positive relationship between FIXCAP and FDI inflow. This means that Jamaica's infrastructure is not well developed to attract FDI inflows.

There is no correlation between GOVSIZE and FDI, which means that GOVSIZE does not bring any change in FDI inflow. This however is consistent with the literature in chapter 2 that there is no consensus on the relationship between GOVSIVE and FDI.

Political Party (POL_PARTY) has positive and insignificant impact on the inflow of FDI in Jamaica. Political party (POL_PARTY) is used as a dummy variable because it plays an important role in the economic climate of Jamaica, hence impact FDI inflows.

4.4 Estimation of the Long-run and Short-run Dynamics

The empirical result of the ARDL (1,0,1,1) presented in Table 5, shows the long-run coefficients. From the summary statistics that is, R^2 , adjusted R^2 and the F-statistic derived from the estimated model, we concluded that the selected ARDL shows a good

⁶⁶ Stephen Onyeiwu and Hemanta. Shrestha, "Determinants of Foreign Direct Investment in Africa," in Journal of Developing Societies, Volume 20, No. 1-2 (2004), 96.

performance. In addition, the diagnostic tests indicated that there are no serious problems with respect to serial correlation, stability and heteroscedasticity (Appendix A).

It should be noted that lagged variables, namely GDPCAP(-1), FDI(-1), INT(-1) and FIXCAP(-1), were selected in estimating the ARDL model. The coefficient of lagged GDPCAP (-1) is equal to -0.488175 which implies an adjustment coefficient of $-1.488175 = -0.488175 - 1$. From the result only FIXCAP was significant at 99% percent significance level, while other variables such as: INT and FDI, are found to be insignificant factors of GDPCAP in Jamaica.

In this long-run equation, the coefficient of FDI is insignificant and has a positive sign indicating that FDI has a positive impact on economic growth, since FDI inflows into developing countries not only act as a complement to domestic credit, but they also help to introduce new technologies and innovations in host countries while providing them with better job opportunities. In addition, INT has a positive and insignificant impact on economic growth in the long-run, this means that a one percent increase in INT yield 4.15 percent decrease in GDPCAP in the long-run. The impact of FIXCAP on economic growth is negative and significant. One percent change in FIXCAP could have the same directional change of -34.51 percent as yield by GDPCAP.

Table 5: Autoregressive Distributed Lag estimates ARDL (1,011)

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|--------------|-------------|------------|-------------|-----------|
| C | 7.076742 | 2.501083 | 2.829471 | 0.0087*** |
| GDPCAPD1(-1) | -0.488175 | 0.120450 | -4.052926 | 0.0004*** |
| FDID1(-1) | -0.290980 | 0.295857 | -0.983516 | 0.3341 |
| INTD1(-1) | -0.047627 | 0.037445 | -1.271899 | 0.2143 |
| FIXCAPD1(-1) | -0.259628 | 0.165240 | -1.571219 | 0.1278 |
| GDPCAP | 0.610575 | 0.121647 | 5.019239 | 0.0000*** |
| FDI(-1) | 0.225613 | 0.411199 | 0.548670 | 0.5877 |
| INT(-1) | 0.041570 | 0.028503 | 1.458426 | 0.1563 |
| FIXCAP(-1) | -0.345129 | 0.123955 | -2.784310 | 0.0097*** |

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|--------------------|-------------|-----------------------|-------------|----------|
| R-squared | 0.649656 | Mean dependent var | | 0.106652 |
| Adjusted R-squared | 0.545851 | S.D. dependent var | | 3.624313 |
| S.E. of regression | 2.442445 | Akaike info criterion | | 4.836194 |
| Sum squared resid | 161.0696 | Schwarz criterion | | 5.232074 |
| Log likelihood | -78.05150 | Hannan-Quinn criter. | | 4.974367 |
| F-statistic | 6.258402 | Durbin-Watson stat | | 1.549287 |
| Prob(F-statistic) | 0.000135 | | | |

Note: Dependent variable is GDPCAP; Subscript (-1) after a variable identifies the lag; ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels of significance, respectively.

Source: E-views 7

In Table 6 below, the coefficient of the error correction model ECT(-1) is -0.622716. The statistically significant value of -0.622716 is the speed up adjustment coefficient which suggested that less than one year divergence between the long-run equilibrium value and the actual value of GDPCAP is corrected during the year. In other word the system is getting adjusted towards long-run equilibrium at the speed of 62.27%. The negative sign (of the adjustment coefficient) and significant value (probability) also confirmed the existence of cointegration between the variables. The result also suggested that there is no short-term impact on economic growth.

An analysis of the table indicates a low coefficient of determination. This can be observed from the value of the R-squared 36.44 percent and the adjusted R-squared 25.84 percent. Although several findings contained R-squared less than 50% in short-run dynamics, the value of R-squared in Table 5 shows 64.97 percent variation in error correction model (short-run equilibrium) in short-run.

Table 6: Error Correction representation for the selected ARDL(1,011)

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|--------------|-------------|------------|-------------|--------|
| C | 0.227724 | 0.524496 | 0.434178 | 0.6673 |
| GDPCAPD1(-1) | -0.170690 | 0.181790 | -0.938936 | 0.3553 |
| FDID1(-1) | -0.014280 | 0.302490 | -0.047208 | 0.9627 |
| INTD1(-1) | -0.022319 | 0.040123 | -0.556251 | 0.5822 |
| FIXCAPD1(-1) | -0.080236 | 0.218567 | -0.367099 | 0.7161 |

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|--------------------|-------------|-----------------------|-------------|----------|
| ECT(-1) | -0.622716 | 0.263578 | -2.362548 | 0.0248** |
| R-squared | 0.364393 | Mean dependent var | | 0.106652 |
| Adjusted R-squared | 0.258459 | S.D. dependent var | | 3.624313 |
| S.E. of regression | 3.120997 | Akaike info criterion | | 5.265194 |
| Sum squared resid | 292.2186 | Schwarz criterion | | 5.529114 |
| Log likelihood | -88.77349 | Hannan-Quinn criter. | | 5.357309 |
| F-statistic | 3.439798 | Durbin-Watson stat | | 2.106979 |
| Prob(F-statistic) | 0.014173 | | | |

Note: **significant at 5% level of significant; Standard error in parentheses. Dependent variable is differenced (GDPCAPD1); d is the first difference operator; ECT = error correction term.

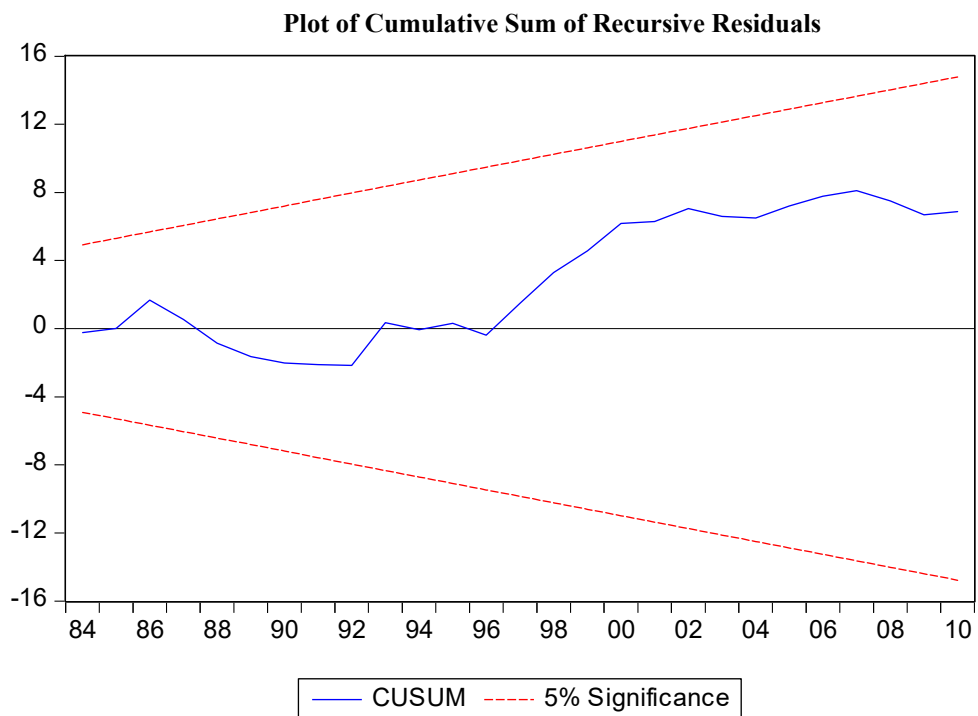
4.5 Testing for Structural Breaks in the Model

Once variables are confirmed for long-run cointegration, we then test the stability of the GDPCAP function. If the graphical plot of the Cumulative Sum (CUSUM) and Cumulative Sum of Squares (CUSUMSQ) stayed within 5 percent significance level, then our proposed GDPCAP function is said to be stable.

To conduct the CUSUM and CUSUMSQ stability tests, we used the model which was reported in Table 6 as proposed by Brown, Durbin and Evans.⁶⁷ For the CUSUM tests the breakpoints are optional, unlike the Chow test where the breakpoints are compulsory. The CUSUM test used the cumulative sum of recursive based on the first n observations, and it is recursively updated and plotted against the breakpoint. The CUSUMSQ test on the other hand, used the recursive residuals squared and follows the same procedure.

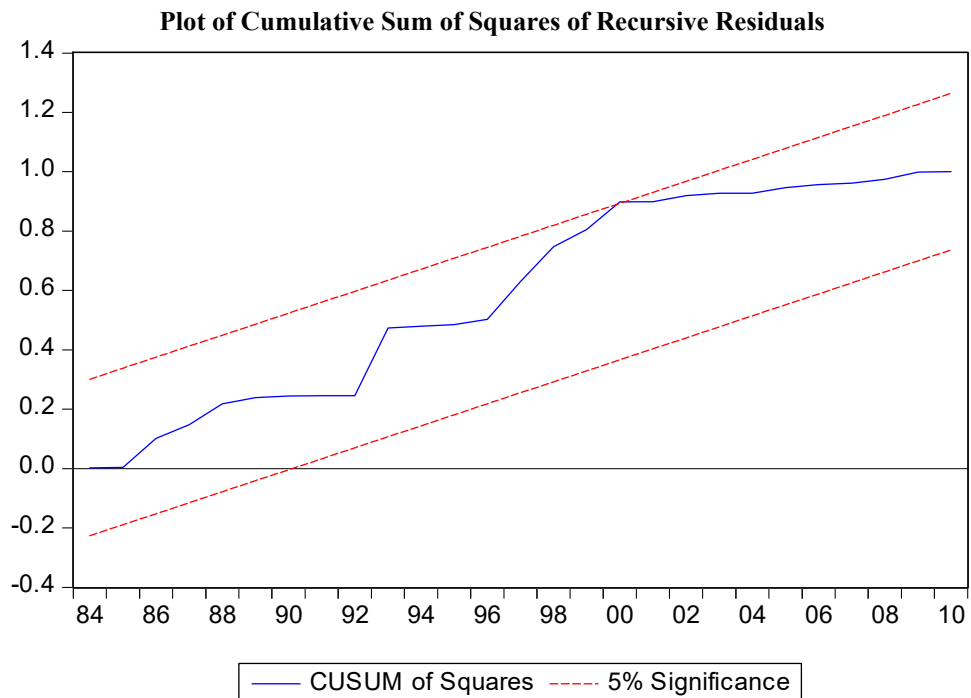
⁶⁷ R. L. Brown., J. Durbin, and J. M. Evans, "Techniques for Testing the Constancy of Regression Relations Over Time," in *Journal of the Royal Statistical Society, Volume 37, No. 2* (1975), 149–163.

Figure 1: CUSUM Tests



Note: The straightlines represent critical bounds at 5% significance level
Source: Eviews 7

Figure 2: CUSUMSQ Tests



Note: The straightlines represent critical bounds at 5% significance level
Source: Eviews 7

Figures 1 and 2 above represent the results of the CUSUM and CUSUMSQ tests. In both figures, the red lines represent both critical lower and upper bounds of the region indicating the 5 percent significance level. The graphs shows no evidence of instability in the regression parameters over the period of study, since both the CUSUM of residuals and the CUSUMSQ of residuals lie within the critical limits of the 5 percent level of significance.

LIMITATIONS OF STUDY

This study was done using a small sample size as the relevant data was not available. As a result, some key variables could not be used but are considered the key challenges in Jamaica. They are governance, crime and violence and taxation. Governance problems lead to lengthy and cumbersome procedures when doing business. A study done by World Bank (2005b) indicated that entrepreneurs have to make 72 payments and spend 414 hours to pay taxes. Similarly, it takes 18 steps and 202 days to implement business contracts, an issue which is paralleled in the lengthy period required to facilitate FDI projects.

The problem with crime and violence are pervasive across the Caribbean with the murder rates and assaults well above world average. A report done by World Bank Report in 2003 estimated that rampant crime costs Jamaica at least four per cent of its GDP, including lost production, health expenses and spending on security. The report further highlighted that high crime rate encourages migration, especially among more educated and internationally mobile population.

POLICY IMPLICATIONS OF THE FINDINGS

The policy implications of this finding are relatively obvious, since growth rate of the economy (GDP) serves as determinants of FDI, government should:

- ✓ Increase its expenditure in the areas of infrastructural development as an avenue to attract more FDI. Besides, the government should create the environment that will regulate macroeconomic policy (exchange rate, inflation, return on interest and openness) which is highly essential for the attraction of FDI.
- ✓ Encourage the investment response to incentive schemes, macroeconomic stability and investor confidence in the sustainability of the policy framework are essential. As a result, the government must correct the unsustainability macroeconomic imbalances such as large public deficits because they are a primary cause of macroeconomic instability and uncertainty about future policies. Institutional reforms to ensure predictability, effective property rights, and stability of the basic 'rules of the games' can contribute significantly to the investment response.
- ✓ manage the relationship between FDI and other political, social and cultural factors. It is important that the government commits to the degree of openness in order to lure foreign capital.
- ✓ formulate export led fiscal and monetary policies that will stabilize and balance Jamaica trade relationship with other economies of the world.

Success in attracting foreign capital inflows would accelerate the accumulation of the country's capital stock, thus setting the stage for the progressive structural transformation of the country's economy from a largely agriculture-based economy to a

growing economy with expanding industrial and service sectors, capable of absorbing the existing labour surplus and reducing unemployment and poverty by improving the living standards of its people.

MANAGERIAL IMPLICATIONS

This paper should serve as a guideline to Policy makers or economists in identifying areas which should be emphasized on when attracting foreign direct investors into Jamaica or any other developing country. The key is to filter the good intentions and proposed a reform package that is based on the limited capacity of the government, the desperate need for optimizing revenue generation and yet still fulfill the ultimate goal of increasing FDI flows.

CONCLUSIONS AND FUTURE STUDY

This study investigated the determinants of foreign direct investment (FDI) and further assessed the impact of foreign direct investment on long-run growth in Jamaica over the period 1973-2010. The result showed that trade openness, inflation, government size and political party are positively correlated with FDI, meaning that as the variables increase, FDI increases by a unit. On the other hand, return on capital, exchange rate and gross fixed capital formation are negatively correlated with FDI, meaning that as variables decrease FDI decrease by a unit.

In identifying the determinants of FDI, we found a mixed relationship between FDI and the macroeconomic variables analysed. One unit increased in GDPCAP, OPEN, INF and GOVSIZE exert positive influence on FDI, while there are negative relationships between FX, FIXCAP and INT on FDI. Political Party (POL_PARTY) has positive and insignificant impact on the inflow of FDI in Jamaica. Political party (POL_PARTY) is used as a dummy variable because it plays an important role in the economic climate of Jamaica, hence impact FDI inflows.

The stability of our proposed GDPCAP model has been examined to assure the short-run dynamics for long-run consistency of parameters applying the CUSUM test based on cumulative sum of recursive residuals and CUSUMSQ test is based on squared recursive residual as initially proposed by Brown, Brown, Durbin and Evans.⁶⁸ The CUSUM test was plotted against the break points. The estimated coefficients are said to be stable in the case of the plot of CUSUMSQ statistic stayed within 5% level of significance.

Based on the overall findings, it is concluded that Jamaica has not done much in attracting FDI. However, it is recommended that further study be done to assess the validity of the data finding. Also to conduct research on a wider scale using additional data and last

⁶⁸ R. L. Brown., J. Durbin, and J. M. Evans, “*Journal of the Royal Statistical Society, Volume 37, No. 2.*”

but not least to see whether or not Jamaica has any ‘spillovers’ such as promoting technology transfers.

APPENDICES

APPENDIX A

Breusch-Godfrey Serial Correlation LM Test:

| | | | |
|---------------|----------|---------------------|--------|
| F-statistic | 1.591818 | Prob. F(2,25) | 0.2235 |
| Obs*R-squared | 4.066575 | Prob. Chi-Square(2) | 0.1309 |

Heteroskedasticity Test: Breusch-Pagan-Godfrey

| | | | |
|---------------------|----------|---------------------|--------|
| F-statistic | 0.528022 | Prob. F(8,27) | 0.8249 |
| Obs*R-squared | 4.870275 | Prob. Chi-Square(8) | 0.7713 |
| Scaled explained SS | 2.452153 | Prob. Chi-Square(8) | 0.9639 |

APPENDIX B

Dependent Variable: FDI
 Method: Least Squares
 Date: 06/02/15 Time: 02:39
 Sample (adjusted): 1974 2010
 Included observations: 37 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|--------------------|-------------|-----------------------|-------------|----------|
| C | -2.429052 | 1.882040 | -1.290648 | 0.2078 |
| FDI(-1) | 0.301727 | 0.155805 | 1.936568 | 0.0633 |
| GDPCAP | 0.103058 | 0.079878 | 1.290189 | 0.2079 |
| INTD1 | -0.062261 | 0.016357 | -3.806491 | 0.0007 |
| POL_PARTY | 0.669764 | 0.478356 | 1.400138 | 0.1729 |
| OPEN | 0.029619 | 0.019417 | 1.525375 | 0.1388 |
| INFD1 | 0.006489 | 0.015207 | 0.426692 | 0.6730 |
| FXD1 | -0.161399 | 0.074913 | -2.154502 | 0.0403 |
| GOVSIZED1 | 0.042961 | 0.217266 | 0.197736 | 0.8447 |
| FIXCAPD1 | -0.171952 | 0.112347 | -1.530544 | 0.1375 |
| R-squared | 0.466108 | Mean dependent var | | 0.626955 |
| Adjusted R-squared | 0.288145 | S.D. dependent var | | 1.581555 |
| S.E. of regression | 1.334382 | Akaike info criterion | | 3.640273 |
| Sum squared resid | 48.07555 | Schwarz criterion | | 4.075657 |
| Log likelihood | -57.34506 | Hannan-Quinn criter. | | 3.793766 |
| F-statistic | 2.619118 | Durbin-Watson stat | | 2.123605 |
| Prob(F-statistic) | 0.025534 | | | |

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