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INVESTIGATING THE LINK BETWEEN INTERNATIONAL TRADE AND FDI IN MAURITIUS: AN ARDL ANALYSIS

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Abstract: *Foreign Direct Investment has played a vital role in the international financial capital flows and has become one of the most striking forms of capital flow for developing nations in the past few years. By investigating and analysing the potential determinants of FDI, this study attempts to seek whether International Trade and FDI are complements in the long-run and short-run for Mauritius over the period 1979 to 2013. After determining the order of integration of the variables, the ARDL-ECM bound testing approach to cointegration was chosen. The bound test confirmed the presence of cointegration. Broadly speaking, the findings from the research acknowledge that International Trade and FDI are complements in the long-run, since the result is positive and significant. The same cannot be said for the short-run.*

JEL Classifications: *F4, F23*

Keywords: *FDI, International trade, ARDL*

1. INTRODUCTION

The world Foreign Direct Investment (FDI), as a major form of capital transfer, has witnessed a rapid growth over the past decade. In fact, it has escalated faster than world trade and world output and is gradually becoming a key driver of economic growth. The global FDI value has witnessed a radical rise, in fact in year 2007 it was nine times higher than in 1990 (UNCTAD, 2009). Besides it can be noted that a large number of countries are now conscious of the major role that FDI has in triggering economic development and this has led them to become part of the international FDI network.

Despite being a small island economy in the Indian Ocean, with a population of about 1.3 million residents, Mauritius is not left unaware of the benefits which FDI can bring to the country. In fact, FDI has played a vital role in diversifying the economy of Mauritius, creating employment and developing the export sector and growth of the country (Lamport *et al.*, 2011). It is noteworthy to say that Mauritius recognised the benefits of liberalising trade at an early stage. As a result, the implementation of several policies namely the adoption of an export-

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oriented strategy has increasingly helped in boosting FDI flows. Moreover, the application of a smart tax policy has made Mauritius the root of a large percentage of FDI flowing into India.

The main objective behind this study is to investigate whether International Trade and FDI are complements or substitutes. This analysis is believed to enhance the literature on the determinants of Foreign Direct Investment by examining the case of Mauritius when it comes to FDI flows. This work is carried out based on the different empirical methodologies used by researchers and finally to analyse the short run and long run dynamics between the independent variables and FDI. A time-series analysis with an annual data set ranging from 1979 to 2013 was used.

The paper is organised as follows: Section 2 provides a review of the literature followed by an overview of FDI and International Trade in Mauritius in Section 3. Section 4 presents the model and the data used and in Section 5 we present the empirical results. Concluding remarks and policy implications are left to Section 6.

2. THEORETICAL REVIEW

2.1. Theories of International Trade

The first theory of international trade was mercantilism and it was the economic system of major trading nations during the 16th, 17th and 18th century. The principle underlying mercantilism was that the prosperity of a nation depended upon its supply of gold and silver. At that time, gold and silver were the currency of trade between nations. The main belief of mercantilism was based on the idea that it was in a country's best interest to export more than it imports since by so doing, the country would increase its stock of gold and silver and, consequently, increase its national wealth and power. However, mercantilism was criticized since it considered trade as a zero sum game whereby gain in one country resulted in a loss by another.

Unlike the doctrine of Mercantilism, the theory of Absolute Advantage proposed by Adam Smith showed that trade was a positive sum game in which all countries could benefit. He also put forward that a country's wealth is based on the goods and services available to the people instead of its stock of gold and silver. According to Smith, a country should specialise and produce goods in which it has absolute advantage and then trade these goods for the goods produced by other countries. By doing so, the country will become more efficient as the labour will become more skilled by repeating the same tasks and there will not be loss of time.

However, the above theory has its limitation. It does not consider the case when one country has an absolute advantage in producing all goods. Eventually, David Ricardo came up with the theory of comparative advantage. Countries should produce and export goods in which they are most efficient and import goods which they produce less efficiently. In this way, both countries will gain from trade.

An alternative to that of David Ricardo is the Heckscher-Ohlin Theory. Eli Heckscher (1919) and Bertil Ohlin (1933) argue that the fact that the difference in the level of factors of production in countries causes comparative advantage to arise. Thus, a country will produce and export goods that use the factors which it has abundantly and import goods which make intensive use of factors that are locally scarce.

In 1954, Professor W. Leontief aimed at testing the Heckscher- Ohlin Theory in the US. He expected that since the US has relatively more capital than other countries, US would export capital-intensive goods and import labour-intensive goods. However, Leontief concluded an opposite relationship. This result has come to be known as the Leontief Paradox. He justified his findings by explaining that US workers might be more efficient than foreign workers due to the fact that US had a superior economic organisation and economic incentives.

The New Trade Theory was developed in the 1980s by researchers like Krugman (1979), Lancaster (1980) and Helpman (1981). The combination of Kindleberger's (1969) theory with Hymer (1976) and Caves (1971) provides the emergence of the new theory of trade. It merges the benefits of ownership (knowledge) and location (market size and low transaction costs) with technology and the intrinsic characteristics of country (factor endowments). The theory was meant to account for three findings:

1. The ratio of trade to GDP witnessed a rise.
2. Industrialized countries trade more frequently among themselves rather than with the rest of the world.
3. A large share of trade occurs among the industrialised countries themselves.

According to Bergoeing & Kehoe (2003), the New Trade Theory explains as the world gets richer, the better they are able to use productive factors more efficiently.

2.2. Empirical Review

Early empirical studies carried out by Robinson (1961), Basi (1966), Wilkins (1970) and Forsyth (1972) have shown that a range of factor particularly market size, market growth and maintaining market share, barriers of trade, cost factors and investment climate were important determinants of FDI.

Trade openness is said to encourage the allocation of resources in an efficient manner through specialization and comparative advantage and competition in both national and international markets. Transmission of knowledge and technology across countries is easily allowed. Moreover if less capital controls and more liberal trade policies are applied, more FDI is attracted (Onyeiwu and Shrestha, 2004).

According to Charkrabarti (2001), the importance of openness in determining FDI has a mixed indication. It is mostly measured by the ratio of exports plus imports to GDP. Indeed, the impact of openness as a determinant of FDI depends on the types of investment (horizontal and tariff-hopping or vertical). This is asserted by Jordaan (2004). If the investment is horizontal, trade restrictions which means less openness can have a positive impact on FDI. The reason comes from the "tariff jumping" theory, which affirms that foreign firms may choose to invest in the host country in an effort to serve local markets if it is not easy to import their products to the country. On the other hand, multinational firms engaged in export-oriented strategies may opt to invest in more open economies since trade protection usually entails higher transaction costs associated with exporting. Several authors illustrate that open economies catch the attention of more FDI. A significantly positive relationship between trade openness and FDI was found out by Root and Ahmed (1978). Jun and Singh (1995) argued that economies having a liberal

trade policy would make foreign investors more convinced. Wheeler and Mody (1992) observed a strong positive support for the hypothesis in the manufacturing sector. This is likely because the investments were horizontal and undertaken in part to get behind trade barriers.

The most robust determinant of FDI is market size. It is measured by GDP per capita and is considered essential to determine FDI (Artige and Nicolini, 2005). In nearly all studies market size has been found to be positively affecting FDI (Shatz and Venables, 2000; Wheeler and Mody, 1992; Kravis and Lipsey, 1982; Reuber *et al.,* 1973). According to Charkrabarti (2001), the idea that a large market is needed to efficiently exploit resources and enjoy economies of scale is supported by the market-size hypothesis. As the market size grows, FDI increases and thus enables investors to benefit from economies of scale. Market size is considered important because foreign investors invest abroad mainly to serve the market in that country.

Root and Ahmed (1979) collected data on 58 developing countries over the period of 1966-1970 and used a single equation analysis to prove that market size is a fundamental determinant of FDI flows. Furthermore, Mottaleb (2007) used a panel data from 60 developing countries to analyse the effect of market size in developing countries. The author found that only countries having big market size, high market potentials and the greater contribution of industries to GDP are likely to attract FDI.

Economic growth is the rise in the amount of the goods and services produced by an economy over a certain period of time. It is mostly measured as the per cent rate of increase in real GDP. Similar to market size, economic growth also has a positive influence on FDI flows. Countries having high and sustained growth rates receive more FDI flows than unstable economies. Several studies (Schneider and Frey, 1985; Dasgupta and Rath, 2000) show that per capita growth has a positive impact on FDI. Schneider and Frey (1985) argued that the growth rate of an economy affects strongly potential development. Similarly, Lim's (1983) growth hypothesis asserts that in contrast to an economy growing slowly, one growing more rapidly encourages greater profit opportunities when they have all other things being equal. Thus, rate of growth can be placed as a determinant of FDI.

Another important determinant of FDI is the availability of good infrastructure, in particular electricity, water, telecommunications and transportation. Infrastructure entails the smoothness by which the business can move in a location (Zhao and Zhu, 2000). Wheeler and Mody (1992), Sun *et al.* (2002) showed an important relationship between infrastructure and FDI flows. Jordaan (2004) also asserted that in order to boost productivity of potential investments in a country, it is important to have a good quality and well-developed infrastructure. In turn, FDI flows will be boosted towards that country.

Loree and Guisinger (1995) studied the determinants of foreign direct investment by the United States in 1977 and 1982 (towards both developed countries and developing countries). They came to the conclusion that variables related to host country policy were noteworthy in developed countries only when infrastructure was an important determinant in all regions.

A potential determinant of FDI is the movement of the price level. Inflation is a macroeconomic indicator mirroring the efficiency of a government and its central bank in controlling the money supply. A drastic increase in the price level is likely to reflect that the macroeconomic policy of the country is instable. Consequently, if inflation rate is high, it is

regarded as a discouraging reason for FDI. This is because there will be a relative rise in the production costs of the host country and it will also create uncertainty in the investment environment. Schneider and Frey's (1985) analysis showed that the higher inflation is, the lower the rate of FDI flows in less developed economies is.

Cheap labour can be considered as an essential determinant of FDI flows to developing countries since it is an important factor of production. Charkrabarti (2001) claims that using wage as a proxy for labour cost has been the most debatable of all the potential determinants of FDI. Several authors namely; Wheeler and Mody (1992), Schneider and Frey (1985), and Loree and Guisinger (1995) provide studies showing that higher wages reduces FDI. Lucas (1993) explained that a rise in wage rate of the host country means a rise in the cost of production which is likely to discourage production and as a result FDI. However, evidence that cheap labour attracts FDI is mixed. High wages may also mean skilled labour, as such the relationship between low wages and FDI does not hold.

It is arguable that human capital can affect the level of productivity. Cartensen and Toubal (2004) argue that FDI brings new technology and in order to use it well-educated workers are needed. Thus, in order to make the investment effective a skilled labour force is required. Brookes *et al.* (2010) also found that skilled labour sectors where a certain level of education is required, productivity increases and facilitates implementation of technological innovations. So a considerable positive relation of FDI can be anticipated particularly for efficiency seeking FDI. Research from Root and Ahmed (1979), Schneider and Frey (1985), Borensztein *et al.* (1998), and Aseidu (2002) also supports that the level of human capital determines the locational advantage of a country thereby, attracting FDI.

It is difficult to decide whether tax incentives trigger FDI. Some studies have revealed that low level of taxes in host country would encourage FDI whilst high level of taxes would discourage foreign investors. Many authors have also found that level of tax does not have an important impact on FDI.

Hartman's (1984) analysis of FDI in US for the period of 1965-1979 found that tax incentives significantly increase FDI. However, Narula and Dunning (2000) argued that tax rates may not be the deciding factor for foreign investors and that other location specific advantages may have a much greater effect. Besides, Cartensen and Toubal (2004) found that the effect which corporate tax rates have on FDI is negative.

According to Goldberg (1993), both the sum of FDI that occurs and the allocation of this investment spending across a range of countries can be influenced by exchange rates. Following currency depreciation, there is a reduction in the country's wages and production costs relative to those of its foreign counterparts. According to Lim (2001), the depreciation of the host country's currency could entail that foreign firms would be able to acquire assets and technology at a cheaper cost and this will increase FDI. Furthermore, in a time series analysis carried by Ramirez's (2006), it was found that a depreciation of the home currency in Chile is the core rationale which stimulates FDI inflows.

The impact of investment and business climate is usually positive but empirical results are mixed due to lack of good measures. If economic factors are considered, a high inflation and a balance of payment deficit can have an adverse impact on FDI flows (Schneider and Frey,

1985). In line with empirical studies, the relationship between the level of political risk and FDI flows is uncertain. For instance, Jaspersen *et al.* (2000) and Hausmann and Fernandez-Arias (2000) find no link between FDI flows and political factors whilst Schneider and Frey (1985) discover the contrary.

By the existence of already foreign owned firms in a country, potential investors easily obtain information about new markets which render them more confident to invest. Foreign investors may prefer to invest in countries having an existing level of FDI (Guimares *et al.*, 2003). Furthermore, Deichmann *et al.* (2003) argued that the level of existing foreign investors mirrors success and market potentials. However, Sun *et al.* (2002) declared that there is a possibility of having a negative agglomeration effect and externalities after a certain level. This is predominantly for the case of China.

In order to promote FDI, government can apply numerous policies for example partial or complete exclusions from corporate taxes and import duties, tariffs, subsidies, regulatory regime and privatization policy. Empirical studies carried by Agarwal (1980) show that the incentives have a partial outcome on the level of FDI, as investors consider their risk and return profile before deciding to invest.

3. OVERVIEW

Despite being a small island economy in the Indian Ocean, with a population of about 1.3 million residents, Mauritius is not left unaware of the benefits which FDI can bring to the country. In fact, FDI has played a vital role in diversifying the economy of Mauritius, creating employment and developing the export sector and growth of the country (Lamport *et al.,* 2011). It is noteworthy to say that Mauritius recognised the benefits of liberalising trade at an early stage. As a result, the implementation of several policies namely the adoption of an export-oriented strategy has increasingly helped in boosting FDI flows. Moreover, the application of a smart tax policy has made Mauritius the root of a large percentage of FDI flowing into India.

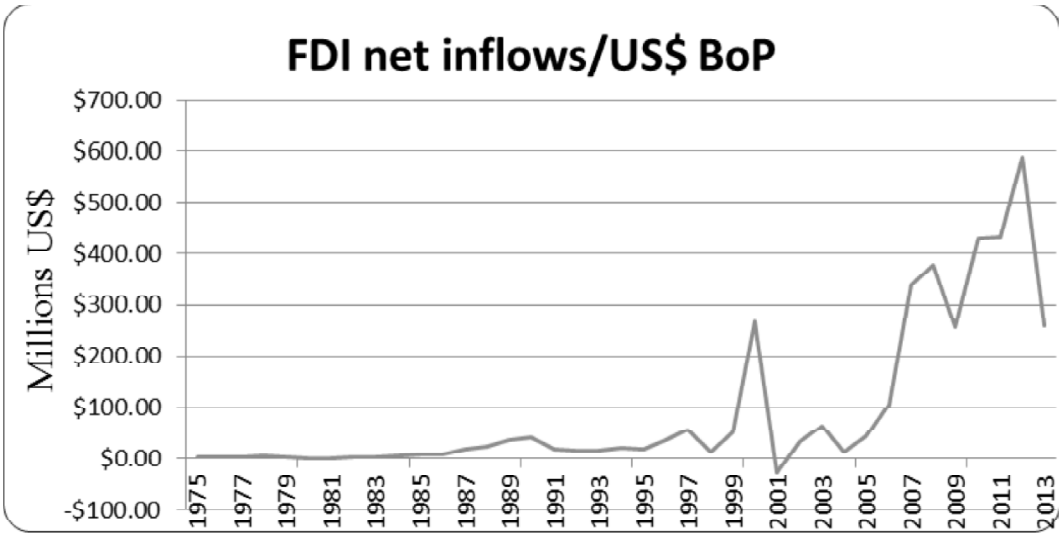
Over recent years, annual growth has been in the order of 5% to 6%. This compares very favourably with other sub-Saharan African countries and is mainly due to continued progress in economic conditions. Moreover, Mauritius has achieved what few fast growing economies achieve which is in terms of a more equitable income distribution and inequality gap also fell considerably. The government's development strategy centers on expanding local financial institutions and building a domestic information telecommunications industry. Mauritius has attracted more than 9,000 offshore entities, many aimed at commerce in India and South Africa, and investment in the banking sector alone has reached over $1 billion. Mauritius, with its strong textile sector, has been well poised to take advantage of the Africa Growth and Opportunity Act (AGOA). Also, Mauritius has attracted massive foreign direct investment inflows. With a well-developed legal and commercial infrastructure and a tradition of entrepreneurship and representative government, it is one of the developing world's most successful democracies. The economy has shown a considerable degree of resilience, and an environment already conducive to dynamic entrepreneurial activity has moved further toward economic freedom. The island's institutional advantages are also important. A transparent and well-defined investment code and legal system have made the foreign investment climate in Mauritius one of

the best in the region. Taxation is also competitive and efficient. The economy is increasingly diversified, with significant private-sector activity in sugar, tourism, economic processing zones, and financial services, particularly in offshore enterprises.

3.1. Foreign Direct Investments in Mauritius

FDI has a significant contribution in the Gross Domestic Product of Mauritius. It is thus primordial for Mauritius to actively compete on a global level to lure more FDI flows. FDI started flowing in Mauritius significantly, mostly in the EPZ and in tourism from the mid-1980s only. They were transformed into leading sectors of the economy and as a result FDI helped the country to lessen its dependence on agriculture to a modern, dynamic and technologically advanced economy with higher per capita income. The government of Mauritius follows a liberal investment policy and actively encourages FDI in all sectors of the economy. Moreover, the government has created the Board of Investment (BOI) to further expand the economic base and induce sustainable growth.

Figure 3.1: FDI Net Inflows (US $) for Mauritius from 1975 to 2013



(*Source:* Author's Calculation)

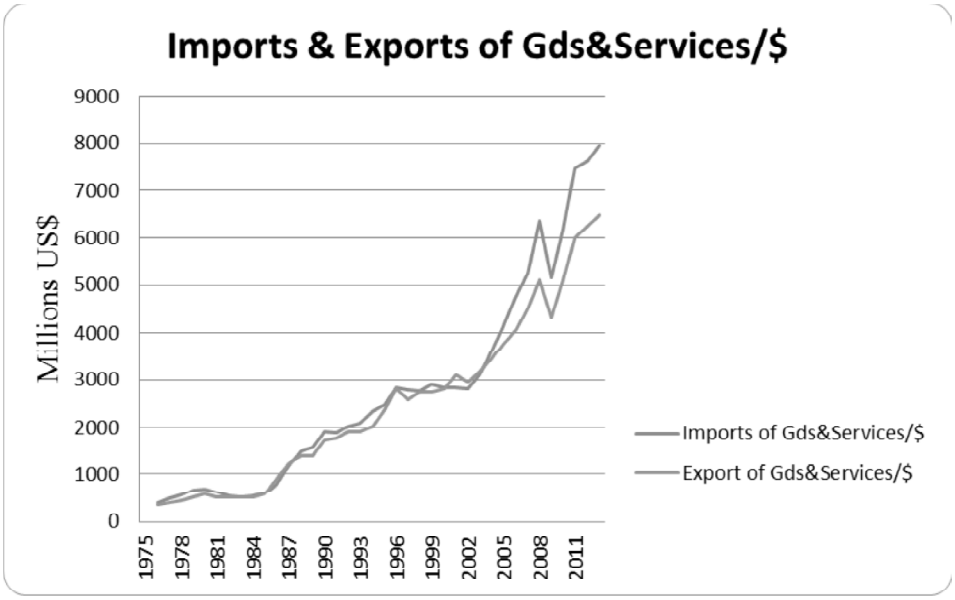
From Figure 3.1, it is noted that FDI net inflows has been increasing from 1975 to 2013. It can be explained by the various incentives the Mauritian government has applied in order to attract FDI in the country.

3.2. International Trade in Mauritius

International trade has proven to be very beneficial for the Mauritian economy. Even if Mauritius imports more than it actually exports and has been on average suffering a trade deficit, international trade has increased employment in several sectors of the economy, has reduced

the poverty gap and has raised the standard of living of the population. According to the MEXA, proper decision making on part of the government to adopt an export-oriented strategy by producing quality products and thus benefiting from competitive advantage, has formed Mauritius to what it is today. To further enhance the global competitiveness of Mauritius, the Ministry of Foreign Affairs, Regional Integration and International Trade has as main goal to make effective trade policies which will favour more trading activities in the economy.

Figure 3.2: Trend in Exports and Imports of Goods and Services (US$) (Mauritius, 1975-2013)



(*Source:* Author's Calculation)

From Figure 3.2, it can be noted that both imports and exports of goods and services have been increasing over the period 1975 to 2011. This is as a result of the various benefits Mauritius enjoys in terms of trade liberalization.

Mauritius imports mainly manufactured goods, capital goods, foodstuffs, oil and chemical products from India, China, France and South Africa. Mauritius is highly dependable on oil since it is not an island that has natural resources under its soil. In contrast, when it comes to export matters, the main trading partners are the European market, Madagascar and USA amongst others. Mauritius exports clothing, sugar, cut flowers, molasses and fish towards these countries. Nevertheless, the export industry does not stand still, efforts to diversify to other sectors like the Sea Food industry and Jewelry, Watches & Diamonds are thriving.

Also, Mauritius is the 131st largest export economy in the world and the 64th most complex economy according to the Economic Complexity Index (ECI). In 2013, Mauritius exported $2.85B and imported $5.45B, resulting in a negative trade balance of $2.61B. In 2013 the GDP of Mauritius was $11.9B and its GDP per capita was $17.7k. The top export destinations of

Mauritius are the United Kingdom ($413M), France ($367M), the United States ($268M), Italy ($262M) and South Africa ($244M). The top import origins are India ($1.25B), China ($807M), France ($450M), South Africa ($383M) and Spain ($211M).

4. METHODOLOGY

The main purpose of the study is to determine whether International Trade and FDI act as complements in the short run and long run in Mauritius. The time period considered is 1979 to 2013 and the findings for this study are based on secondary data and have mostly been retrieved from the online database of the World Bank. In order to carry out the present study the empirical relationship used in previous studies like Wheeler and Mody (1992), Quazi (2005) and Seetanah and Rojid, (2011) was formulated as follows:

$$FDI = f (IT, SIZE, EXR, INF, SER) \quad (1)$$

Where:

FDI = FDI net inflows (US$), IT = Trade openness as a % of GDP, i.e. [(Imports + Exports) as a % of GDP], SIZE = Size of market [GDP per capita (%)], EXR = Exchange rate Rs/$, INF = Inflation Rate (%), SER = Secondary enrolment rate

Following the above function, the econometric model to be used in this study is derived by applying log on both sides (for ease of interpretation) and is as follows:

$$fdi_t = \beta_0 + \beta_1 it_t + \beta_2 size_t + \beta_3 exr_t + \beta_4 inf_t + \beta_5 ser_t + \mu_t \quad (2)$$

β_0 is the constant term whilst β_1, β_2, β_3, β_4 and β_5 represents the parameter estimates and μ_t is the random disturbance term. The lowercase letters denote the variables as the natural log of the respective uppercase variables. The variables are defined below;

Variables	*Measure*	*Description*	*Sources*
FDI	FDI	FDI inflows (US$)	World Bank
IT	Level of trade openness, i.e. International Trade Flows into and out of the country	Trade as a % of GDP, i.e. [(Imports + Exports) as a % of GDP]	Computed from World Bank Data
SIZE	Size of the market	GDP per capita (%)	World Bank
EXR	Real Exchange Rate Rs/$	Real Exchange Rate Rs/$	World Bank
INF	Inflation Rate	Consumer price index	World Bank
SER	Human Capital: Level of education	Secondary school enrollment rate	World Bank

5. FINDINGS AND ANALYSIS

5.1. Preliminary Tests

It is crucial to test the stationarity type of the variables in order to determine the appropriate time series approach to be used. We therefore carry out unit root tests on the dependent and independent variables. In this study, the Augmented Dicker-Fuller test (ADF) (1979) and the Philips-Perron (PP) (1988) test were applied to identify their order of integration and thus their stationarity.

The outcomes of the unit root test of all the variables in the model are I(d), where 0 d" d d" 1. It can thus be deduced that the ARDL procedure will be adopted since it requires that all the variables included to be having a mixture of I(0) and I(1).

5.2. Cointegration Tests

The ARDL approach was first introduced by Pesaran and Shin (1999) and it was further developed by Pesaran, Shin and Smith in 2001.

Basically, the first step is to establish the existence of long-run relationship among the variables. The ARDL-ECM can be estimated by transforming equation (2):

$$\Delta fdi_t = \alpha_0 + \lambda_1 fdi_{t-1} + \lambda_2 it_{t-1} + \lambda_3 size_{t-1} + \lambda_4 exr_{t-1} + \lambda_5 \inf_{t-1} + \lambda_6 ser_{t-1} + \Sigma_{k=1}^{p} \theta_k \Delta fdi_{t-1}$$

$$+ \Sigma_{i=1}^{q_2} \theta_2 \Delta it_{t-i} + \Sigma_{i=1}^{q_3} \theta_3 \Delta size_{t-i} + \Sigma_{i=1}^{q_4} \theta_4 \Delta exr_{t-i} + \Sigma_{i=1}^{q_5} \theta_5 \Delta \inf_{t-i} + \Sigma_{i=1}^{q_6} \theta_6 \Delta ser_{t-i} + v_t \quad (3)$$

Where α_0 denotes the drift parameter, ë$_i$ and θ_i are the long- and short-run multipliers and 5ØßÇ$_t$ is the error term.

After testing if there is long-run cointegration in the theoretical ARDL (p, q_2, q_3, q_4, q_5, q_6), the following long-run model was estimated:

$$fdi_t = \propto_1 + \Sigma_{k=1}^{p} \gamma_k fdi_{t-k} + \Sigma_{i=0}^{q_2} \theta_{1i} it_{t-i} + \Sigma_{i=0}^{q_2} \theta_{2i} size_{t-i} +$$
$$\Sigma_{i=0}^{q_4} \theta_{3i} exr_{t-i} + \Sigma_{i=0}^{q_5} \theta_{4i} \inf_{t-i} + \Sigma_{i=0}^{q_6} \theta_{5i} ser_{t-i} + \varepsilon_t \quad (4)$$

Following this, the short-run dynamics of the ARDL model will be derived by constructing an error correction model of the following form:

$$\Delta fdi_t = \alpha_2 + \Sigma_{k=1}^{p} \emptyset \Delta fdi_{t-i} + \Sigma_{i=1}^{q_1} \varphi_i \Delta it_{t-i} + \Sigma_{i=1}^{q_2} \varphi_i \Delta size_{t-i} +$$
$$\Sigma_{i=1}^{q_2} \varphi_i \Delta exr_{t-i} + \Sigma_{i=1}^{q_1} \varphi_i \Delta in f_{t-i} + \Sigma_{i=1}^{q_5} \varphi_i \Delta ser_{t-i} + \omega ECM_{t-i} \_ \mu_t \quad (5)$$

Where φ_j represents the short-run impacts and ω is the coefficient of the ECM_{t-1} and gives the speed at which the model is adjusting to the long-run equilibrium.

The ARDL model is said to be cointegrated if the coefficients of all lagged level variables are jointly significant in the long-run (Pesaran et al., 2001). The cointegration test was carried out using the Wald test and the F-value obtained was contrasted with the F-statistics table developed by Pesaran et al. (2001)[1]. The null hypothesis is that there is no cointegration is tested. The hypotheses are as follows:

H0 : λ1 = λ2 = λ3 = λ4 = λ5 = λ6 = 0 [No Cointegration]

H1 : λ1 ≠ λ2 ≠ λ3 ≠ λ4 ≠ λ5 ≠ λ6 ≠ 0 [Cointegration]

Results from Table 5-1 reveal that the computed F-statistics is 4.448121 and is greater than the upper bound value of 4.14 at a 10% significance level (with unrestricted intercept and no trend). Therefore, the null hypothesis of no cointegration is rejected and it can be established that there is a long-run relationship between FDI and the other dependent variables. The model can thus be used to estimate the long run and short run dynamics.

Table 5.1
Wald Test Results for Cointegration

Dependent Variable	*Computed F-Statistics*	*Significance Level*	*Lower Bound Value*	*Upper Bound Value*	*Conclusion*
Fdi	4.448121	5%	3.79	4.85	No Cointegration
		10%	3.17	4.14	Cointegration exists

Source: Author's calculation

5.3. Long run ARDL-ECM dynamics and interpretations

Table 5.2
Results for Long-run Coefficients (ARDL Model)

Variables	*Coefficients*	*P-values*
It	4.332688**	0.0256
size	0.623458**	0.0412
exr	0.748937	0.4824
inf	-0.166446	0.4959
ser	4.194445**	0.0126
C	-3.797727	0.3734

Source: Author's calculation

Generally, the R^2 is a statistical value which designates how well the sample regression line fits the data. The R^2 of the regression is 0.799975 and when adjusted is 0.762. It is an indication that for the time period of 1979 to 2013, 76.2% of the variation of FDI in Mauritius is explained by the explanatory variables used in the model.

From the results obtained for the long-run ARDL, it is eminent that they are more or less consistent with the literature in Section 2. In the Mauritian economy, it is international trade which has the greatest impact on FDI and is closely followed by secondary enrolment ratio.

The coefficient of International Trade is significant at 5% significance level. With a positive value of 4.332688, it is apparent that international trade is complementary to FDI (net inflows) in Mauritius. A 1% rise in International Trade will result to 4.33% increase in FDI in the long-run. It is also worth mentioning that the degree of this coefficient is relatively higher as compared to the other variables. This implies that international trade considerably improves FDI attractiveness. This result is in line with findings of Jun and Singh (1996) and Root and Ahmed (1978) amongst others.

Over the past few years, the government of Mauritius has implemented several policies which have helped to boost the level of FDI, namely, embarking on an economic reform program which aimed to open the economy, facilitate business and improve business climate. In fact Mauritius has proved to be a success story when it comes to FDI flows. They have given much importance to opening the country to trade. According to the Ease of Doing Business Report 2013, Mauritius is ranked 15th in trade across borders in 2013. This is an indication that countries which embark in trade liberalisation are rewarded with more FDI.

As previously mentioned, the implementation of an export-oriented strategy has motivated foreign investors to invest in Mauritius. These investors potentially look for new markets to

export their products and aim at exploiting the country's comparative advantage. The textile industry is an important pillar in the export sector and FDI is also highly concentrated in this sector.

Moreover, it is also good to point out that tax incentives promote FDI inflows into the island. Mauritius is a low tax jurisdiction and there is no capital gain tax in Mauritius. As such, rather than exporting goods to Mauritius and paying tariffs, firms will prefer to establish a subsidiary on the island to tap the local and foreign market. Besides, companies' holding a Global Business Licence of Category 1 have to pay an effective tax rate of 3% only on an automatic deemed tax credit of 80 percent on foreign sourced income. In fact it has been proven that this policy has promoted massive FDI flows. The Double Taxation Avoidance Agreements (DTAA) between Mauritius and India is a perfect example. Companies registered under this agreement have an option to pay taxes in the island nation.

Size of the market is an illustration of Mauritius's economic condition. Its coefficient is positive and significant at 5% significance level. The result is consistent with the research done by Wheeler and Mody (1992) and others. The Mauritian economy has drastically changed over the past few years. The EPZ was amongst the first factors causing this change. Asian investors were keen to set up textile factories in order to gain preferential access of exports from the island to European and US markets, thereby boosting FDI in Mauritius. Nevertheless, the positive coefficient of 0.623458 can be explained by the development of new economic pillars like the offshore, financial and service sector. There has been continuous effort to promote a good image of the Mauritian capital markets vis-à-vis foreign investors. The implementation of GBOT/ Bourse Africa in the country is an effort to boost FDI flows.

As expected, the influence of human capital on FDI is positive and significant at 5% significance level. A 1% increase in secondary enrolment ratio will bring about 4.19% increases in FDI. This result is supported by past studies (Noorbaksh et al., 2001 and Aseidu, 2002) and it confirms that apart from labour cost, the quality of the labour force is also a major concern for potential investors.

The coefficient for exchange rate was found to positively affect the movement of FDI flows. The major reason behind this could be the fact that no approval is required for profits repatriation, dividends or capital gains earned by a foreign investor in Mauritius. Conversely, the coefficient inflation rate negatively affects the movement of FDI flows. Inflation rate is said to negatively affect the level of business investment as well as the efficiency with which factors of production are put to use. However, both variables were found to be insignificant.

5.4. Short run ARDL-ECM Dynamics and Interpretation

Based on equation (5), the short-run dynamics of the model is derived. The aim is to find out the short run deviation from long run equilibrium by estimating the speed at which the dependent variable converges to equilibrium after a change in the independent variables. The ECM technique has been used.

From the above table, the R^2 value of 0.79 advocates that the ecm fits the data reasonably well. In terms of short-term dynamics, we observe that the results differ from that of the long-run.

Table 5.3
Results for Short-Run Dynamics
(ARDL Model: Dependent Variable: Dfdi)

Variables	*Coefficients*
Dit	3.123058
Dsize	-0.502444
Dexr	0.108529
Dinf	0.218032
Dser	-30.65959
C	1.624786
Ecm(-1)	-1.092807*

Source: Author's calculation

International Trade coefficient is not significant in the short-run. While, the coefficient for exchange rate is positive the magnitude, at which it is positive, is lower than that in the long-run. On the other hand, in comparison with the long-run effect, inflation rate is noted to be having a positive short-run value of 0.218032. It is noted however, that both variables are insignificant.

For market size and secondary enrolment ratio variables it is noted that these two variables have a positive impact on FDI only in the long run.

More results disclose that the estimated error correction coefficient, ecm(-1), is negative and significant at 1%. Thus, it is eminent that the variables show convergence towards their long run equilibrium. The value of -1.092807 suggests that a high speed at which the difference between the current value of FDI and the long-run equilibrium value is corrected within one year.

5.5. Diagnostic Tests

A series of diagnostic tests have been performed in order to verify the healthiness of the model. These include Breusch-Godfrey serial correlation LM test, Ramsey's RESET test for correct functional form and Jarque-Bera normality test. Table 5-4 provides an insight of the test results for the ARDL-ECM model.

Table 5.4
ARDL-ECM Model Diagnostic Tests

Test Performed	*ARDL-ECM Model*	
	F-Statistics	*P-Value*
Serial Correlation	0.045123	0.9568
Functional Form	0.018052	0.9016
Normality: Jarque-Bera	1.293473	0.5238

Source: Author's calculation

From the results obtained, it was found that the model has no problem of serial correlation. Besides the results are guaranteed to be valid and reliable as the sample data is normally distributed.

6. CONCLUSION

As a rule of thumb, the main aim of the above study was to carry out an investigation and analysis of the relationship between International Trade and FDI in the Mauritian economy. Furthermore, several other potential determinants of FDI have been used and their impacts have been noted. A time series analysis has been carried out using annual data ranging from 1979 till 2013. Before deciding which time series model to use, the ADF and PP tests have been performed to test for stationarity and it was found that the variables had a mixture of I(0) and I(1) order of integration. As a result, the ARDL-ECM model was chosen to analyse the long- and short-run relationships. Moreover, the bound test for cointegration confirmed the presence of cointegration and consequently, the study progressed towards estimating the long- and short-run coefficients.

For the long-run, the results show that International Trade is significant at 5% with a positive coefficient of 4.332688. The result is in line with previous studies and it proves that international trade considerably improves FDI attractiveness. Several policies implemented to liberalise trade has rewarded Mauritius with more FDI. Namely, the adoption of an export-oriented strategy has encouraged investors to come to Mauritius to exploit its comparative advantage and to tap new markets. It is also noteworthy that Mauritius is ranked 15th in trade across borders. It is true that due to tax incentives and DTAs, there has been massive inflow of FDI in Mauritius coming mainly India.

Also, market size is positive and significant at 5%. The development of the offshore, financial and service sector and the continuous growth of the EPZ can account for this positive effect. The study also confirms that human capital is also an important ingredient in making a better image of Mauritius in front of foreign investors.

As per the short-run results, it is seen that International Trade is not complementary to FDI. After performing several diagnostic tests, the model was found to be free from the problem of serial correlation. Besides, the model is correctly specified and the normality test executed, it can be concluded that the regression results can be trusted. As such, the interpretations of the model are not biased. Finally, the model also does not suffer from any structural instability.

Note

1. Comparison is made with the critical values tabulated in Table CI (iii) of Pesaran *et al.* (2001). The tabulated F-statistics has two critical bounds, lower bound I(0) and upper bound I(1). If the F-value obtained is larger than upper bound, it means a long run relationship exists among the variables while if the F-value is less than lower bound, a long run relationship does not exist and if calculated value is between two bounds the result is inconclusive.

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