

Determinants Of Foreign Direct Investment In Mauritius: Evidence From Time Series Data

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Abstract: Over the last two decades Foreign Direct Investment (FDI) claimed an impressive economic record, as it enables economy to transit from an agrarian to knowledge based economy. This paper focuses on the determinants and impact of FDI in Mauritius using annual time series data from 1975 through 2015. The Vector Error Correction Model (VECM) analysis reveals that macroeconomic variables namely inflation rates and exchange rate are among the major and important factor that affect FDI in Mauritius over this period of time. Exchange rate exhibited negative significant influence on FDI while interest rate affects FDI positively. The study therefore recommends that government should continue to diversify the export and tourism markets, ensure stable macroeconomic policies, implement reforms on doing business, increase its expenditure in the area of infrastructural development and redirect FDI in productive sector of the economy as ways to accelerate the growth of Mauritian economy.

Keywords: Exchange rate, FDI, Interest rate, Mauritius, VECM

1. INTRODUCTION

Foreign Direct Investment (FDI) is an investment made to acquire a lasting management interest (normally 10% of voting stock) in a business enterprise operating in a country other than that of the investor defined according to residency (World Bank, 1996). Such investments can either take the form of "greenfield" investment (also known as mortar and brick investment) or merger and acquisition, which entail the acquisition of existing interest rather than new investment. FDI also comprises of reinvesting earnings or loans and similar capital transfer between parent companies and their affiliates. Countries can host to FDI projects in their own country and at the same time invest in other countries' project. A country's outward FDI comprises those investment projects owned abroad while inward FDI is made up of the hosted FDI projects. FDI is a major driver of economic transformation, creation of employment, improvement in technological which ultimately leads to economic growth. FDI plays a vital role of meeting the development, foreign exchange rate, investment, and tax revenue needs of developing countries (Smith, 1997; Quazi, 2007). FDI also benefits developing economies by creating employment and growth, enhancement of efficiency, domestic savings and capital investments, integration into the global economy, productivity growth, raising skills of local manpower transferring technology and knowledge (Anyanwu, 2006; Dupasquier & Osakwe, 2006; Walfure and Nurudeen, 2010; Saqib et al, 2013; Fauzel et al, 2015). Asiedu (2002) points out that FDI to the developing world, as a percentage of total foreign investment increased from 24% to 61% from 1990 to 2000. The increasingly considerable role of FDI in the growth dynamics of countries has created much research interest among scholars. Research has been focused more on the determinants of FDI, among which there is labour costs, country size, political factors, education and trade openness.

Moreover, there are several studies on the determinants of FDI in developed and developing countries, but there are quite a few studies which concentrate on a region and yet a minimal on Mauritius. Thus, this study tries to fill in the gap in the existing literature by examining the determinants and impact of FDI in Mauritius. Econometric analysis, namely the Ordinary Least Squares (OLS) regression technique is performed using annual time series data from 1975 to 2015 for Mauritius. Co- integration and error Correction Model (ECM) is also used for data estimation. The rest of this paper is organised as follows: Section 2 reviews existing theoretical and empirical literature on FDI, while section 3 describes the Mauritian economy over the years. The next section introduces the econometric analysis and reports the regression results by providing a detailed interpretation of the results. Finally, all the conclusions deduced from the results as well as the recommendations are given in section 5.

2. LITERATURE REVIEW

According to the International Monetary Fund, FDI is international investment made by a resident entity in one economy (direct investors) with the objective of establishing a long term relationship between the direct investor and enterprise resident in an economy (direct investment enterprise). Direct investment involves both the initial transaction between the two entities and all subsequent capital transactions between them and among affiliated enterprises, both incorporated and unincorporated. As per the World Bank, FDI is defined as the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. FDI is typically carried out by multinational enterprises (MNEs) because they have their employees abroad and could finance their operations with these funds. There are two types of FDI namely the horizontal FDI where MNEs invest in different countries to produce the same goods and services and the vertical FDI where MNEs benefit from factor price difference and trade cost. FDI is mainly determined as a result of human capital development, infrastructure, market size, natural resources and openness. FDI is a country's export and import of long-term capital into investments controlled by its residents and recorded in the capital account of its balance of payments. Consequently, it may affect economic growth directly by

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contributing to capital accumulation and transfer of technology to the host country, or it may contribute to economic growth indirectly where the direct transfer of technology augments the stock of knowledge through labour training and skill acquisitions. Thus, FDI can be carried out through three types of foreign market entry modes, namely, joint ventures, mergers, acquisitions and Greenfield investment. There are several reasons why MNEs choose to invest away from their home countries. Moreover, Arango (2009) stated that FDI policies can be classified into two namely passive policies which related to comparative advantage based on the countries' geographical location, low labour cost, natural resource availability and active policies which relate to the policies that are framed by government to attract more FDI which includes infrastructure development, macroeconomic stability and trade liberalization. The active policy should align with the countries development objectives as well as the MNE's strategy for mutual benefit. The theoretical framework for FDI determinants started with the work of Hymer in 1976. It provides a framework which groups both macro and micro level determinants in order to analyse where and why MNEs invest abroad. It also compares the difference between FDI and portfolio investment. Based on the portfolio investment theory, capital moves from the place where there is low interest rate to high interest rate until interest rate is equal everywhere, assuming there are no barriers to capital movement such as risks and uncertainties. But in the portfolio investment theory, investors who invest in foreign countries do not have a right to control enterprises where they invested their money. MNEs control foreign enterprise to make sure their investment is safe and to eliminate competition in foreign countries and other countries. Hymer analysed the advantage of the foreign firms over host firms and found that foreign firms benefits from lower cost of production, know how, patents, capital to name a few. MNEs prefer to engage in direct investments where market imperfection exists such as barrier of market entry, high transaction cost. The theory of capital movements was the earliest explanation for FDI, which was viewed as a part of portfolio investments (Iversen, 1935; Aliber, 1971). It is based on the classical and neo-classical theory of capital arbitrage assuming that market for cross-border exchange is a costless mechanism, resources is assumed to be immobile across national boundaries but mobile within national boundaries, firms are assumed to engage in a single activity, entrepreneurs are assumed to be profit maximisers and the managerial strategy is assumed to be confined to identifying the optimum level of output. This theory addresses only the 'where' to produce issue. It stipulates that capital flow from a country where rate of return is low to where rate of return is high. It mainly deals with financial FDI whereby investors look for arbitraging opportunities in order to engage in FDI. Hymer's (1960) ground-breaking contribution was the first explanation of FDI in the industrial organisation tradition. It was a considerable departure from the classical/neo-classical models. FDI involved the transfer of a package of resources namely technology, management skill, finance, capital among others. He also saw FDI as a means of transferring both tangible and tacit in order to organise production abroad, while portfolio investments are transfers which did not involve ownership or right to control

enterprises where they invested their capital. Unfortunately, Hymer failed to distinguish between structural and transaction costs market imperfections and put forward that MNE existed for monopolistic reasons and did not consider that the hierarchical organisational structure could replace imperfect markets for reasons of efficiency. Therefore, he paid limited attention to the location of MNE activity which is an important parameter for firms in their decision to undertake foreign production. In a similar way, Vernon (1966) used the product life cycle concept to study the contribution of FDI. His theory is a micro-economic concept which consists of three production stages, starting with the new product stage where products are produced in the home market and are being consumed locally. In the next stage, when the product matures, mass production techniques are adopted when the general standards and characteristics of the product emerge. The innovating enterprises start exporting to developed countries and enjoy the profit of the sales of newly invented product until rival enterprises copy and produce the same product. The next stage is the standardised product stage where the product becomes more familiar to both consumers and producers. Demand may continue to rise, and to cater for the increasing demand of the product, the firm will delocalise its production facilities to lower cost producing countries. Thus, economies of scale, transportation and labour cost are the determinant factor for location choice. However, this theory is criticised as some enterprises skip export in the process and go directly to invest. The eclectic paradigm (Dunning, 1980, 1993) is the Ownership, Location and Internalisation (OLI) advantages-based framework that group micro- and macro-level determinants in order to analyse why and where multinational companies (MNCs) invest abroad. The ownership advantages include property rights/patents, trade-marks, goodwill and other intangible assets which will help the firms to compete easily in the host country. It would have been difficult to get this advantage in home country. The location advantages are those that advantage which will make the firm more profitable to produce and sell in the host country, rather than to produce at home and export to the other country. These advantages will be in terms of labour advantages, natural resources, trade barriers that restrict imports, gains in trade costs and strategic advantages through intangible assets. Thus, accessing the market will be easy. Internalisation advantages arise from exploiting imperfections in external markets, including reduction of uncertainty and transaction costs in order to generate knowledge more efficiently as well as the reduction of state-generated imperfections such as tariffs, foreign exchange controls, and subsidies. These investments could be in forms of: resource seeking (to access raw materials, labour force, and physical infrastructure resources), market seeking (horizontal strategy to access the host-country domestic market), efficiency seeking (vertical strategy to take advantage of lower labour costs, especially in developing countries), and strategic-asset seeking (to access research and development, innovation, and advanced technology). The Uppsala model (Johanson and Vahlne, 1977) posits that MNEs engage in FDI incrementally. This Nordic internationalisation model is developed by researchers in Uppsala University, where "they focus on the gradual, acquisition, integration and use of knowledge about foreign

markets and operations, and on the incrementally increasing commitments to foreign markets” (Johanson and Vahlne, 1977). In this model, knowledge is the determining factor to get new market opportunities in foreign countries. The process starts in neighbour countries and continues in other countries which are far away. Like the product life cycle theory, Nordic internationalisation model discusses the steps that firms takes to international production in order to get involved in foreign countries. The study had been carried out to discover how Swedish firms got involved in foreign market; these firms export through agents then they establish sales subsidiary and finally they start producing in the foreign country. There exists a wide range of empirical literature which seeks to identify the determinants of FDI inflows. The study of Anyanwu (1998) attempts to examine the determinants of Nigeria’s net FDI during the period 1970-96. He finds that domestic investment, domestic market size or GDP, indigenisation policy, openness of the economy and the structural adjustment programme are among the major determinants of Nigeria’s net FDI. He further notes that the structural adjustment programme and the abrogation of the indigenisation policy in 1995 encouraged FDI inflow into Nigeria. Moreover, using the co-integration technique, Salako and Adebusuyi (2001) focus on the empirical determinants of FDI in Nigeria. Their results indicated that exchange rate, infrastructures development and credit to the domestic economy were some of the main factors that influence FDI flows to Nigeria. It was also observed that FDI was sensitive to domestic interest rate and real per capita income while there is need to maintain political stability in order to attract FDI to Nigeria. On the other hands, Chakrabarti (2001) applies the extreme bounds analysis to find the in determinants of FDI inflows. He concludes that inward FDI is affected by the market size measured by GDP per capita. Further, he indicates that openness is a fragile determinant and is positively correlated with FDI. Amadi (2002) uses the ordinary least square regression technique for Nigeria between 1970 and 1997 to examine the impact of the macroeconomic environment on FDI. The author finds that some macroeconomic variables such as GDP per capita, interest rate and exchange rate had significant and very strong influence on FDI, others variables like inflation rate, unemployment record had weak relationship with FDI. The study concluded that macroeconomic environment plays a vital role in determining the volume of FDI inflows. Using 24 countries in Sub Saharan Africa (SSA) over the period 1984–2000 in examining the determinant of FDI inflows, Asiedu (2002) results show that trade liberalization, a higher return on investment and better infrastructure promote FDI in non SSA countries but these factors have no significant effect in SSA countries. As such, FDI is uniformly lower in SSA. The result also shows that trade openness has positive impact on both SSA and non-SSA, but SSA received less FDI compared to non SSA. Moreover, Cuadros, Orts, and Alguacil (2004) use quarterly data for Mexico, Brazil and Argentina from late seventies to 2000 to estimate the causal relationship among trade, inward FDI and output. Using the vector autoregressive model, they find that trade and FDI are complements in Mexico. Trade and FDI exhibit substitutive relationship in Brazil, while no evidence of casual relationship was found in Argentina. Using data for

25 transition economies covering the period 1990- 1998, Kinoshita and Campos (2004) attempt to find the determinants of FDI. They find that the determinants of FDI vary across the choice of sample. Agglomeration economies, bureaucratic efficiency, low labour costs and natural resource are among the key factors affecting foreign investors’ decisions. The main determinants of FDI in the Eastern European and Baltic countries are natural resources and low level of human capital while external liberalisation is important to attract FDI in Commonwealth of Independent States countries. On the other hand, the Frenkel et al., (2004) study attempt to assess the determinants of FDI focusing on bilateral FDI flow between 5 home countries and 22 emerging economies from Asia, Latin America and Central & Eastern Europe. Using the panel data analysis based on gravity model, their findings show that economic development, trade openness have a positive effect on FDI inflow to host countries. Market size has a significant role for FDI inflows, while inflation has a negative effect on FDI. Distance between host and home countries is inversely related to FDI flow. Using time series data over the period 1974 – 2001, Astatike and Assefa (2005) try to look for the determinants of FDI in Ethiopia. The results show that the growth rate of real GDP, export orientation and trade liberalisation affect FDI inflows positively in Ethiopia, while macroeconomic instability and poor infrastructure negatively affect FDI. Similarly, Asiedu (2006) uses a panel data for 22 countries in SSA over the period 1984–2000, to investigate the influence of natural resources, market size, host country’s institutions and political instability on FDI flows. The panel analysis reveals that countries endowed with natural resources or countries having large markets will be able to attract more FDI. Further the author finds that countries that are endowed with natural resources or have large markets attract more FDI. In addition, countries with an educated labor force, an efficient legal system, good infrastructure, less corruption, macroeconomic stability, openness to FDI and politically stable promote inward FDI. Moosa and Cardak (2006) carry out an extreme bound analysis to examine the determinants of FDI in 138 countries. They find country risk, exports as a percentage of GDP and telephone lines per 1000 of the population affect FDI inflows positively. A high degree of openness, low country risk and large economies are found to be positively significant to FDI inflows for developed countries. Moreover, Gholami et al (2006) uses a sample of 23 developed and developing countries observed for the period 1976–99 based on ICT data availability to show that in developed countries, existing ICT infrastructure attracts FDI; a higher level of ICT investment leads to a higher level of FDI inflows but in developing countries the direction of causality goes instead from FDI to ICT. Moreover, the result from Ang (2008) study shows a positive relationship between FDI and trade in Malaysia. Using annual time series data for the period 1960-2005, the author finds infrastructure, increases in financial development, market size and trade openness promotes FDI, while appreciation of the real exchange rate and higher statutory corporate tax discourage FDI inflows in Malaysia. Moreover, Awam, Khan and Zaman (2010) attempt to examine the overall impact of FDI inflows in Pakistan using annual time series data for the period of 1971- 2008. Their study reveals that trade openness, gross fixed capital formation and inflation rate

affect FDI positively while current account deficit affect FDI negatively. A study by Hailu (2010) sheds light on the relationship FDI and trade balance. Using the panel data for 16 African countries for the period 1980 to 2007, the paper concludes that good infrastructure, labour quality, market accession, natural resources and trade openness positively affect FDI inflows while the availability of stock market has positive but insignificant effect. Using cross-country data in 13 Southern African Developing Countries (SADCs) to investigate the benefits and determinants of FDI in the region, Lederman, Olarreaga and Payton (2010) find that income level, human capital, demographic structure, institutions, and economic track record affect FDI inflows per capita. Income level is less important. However, relative to other regions of the world, SADC received low FDI inflows, and this is explained by economic fundamentals namely average income, phone density, previous growth rates and the adult share of population. Trade openness is important for attracting FDI. Furthermore, Mahmood and Ehsanullah (2011) used annual data from 1972-2005 to analyse the impact of macroeconomic variables on FDI in Pakistan. Using the time series analysis, they find that democracy, enrolment at secondary school and population growth have positive impact on FDI while manufacturing products, real exchange rate, real exports and import duty negatively affect FDI. Anyanwu (2011) uses a panel data model to explore the determinants of FDI inflow to Africa for the period of 1980 to 2007. The author reveals that high government consumption expenditure, large market size, trade openness have positive impact on FDI to Africa while high remittance has positive effect on FDI inflow. Natural resource endowment also proved to contribute positively in FDI inflow and East and Southern African sub-regions attract more FDI compared to the other African countries. The study by Khachoo and Khan (2012) examine the main determinants of FDI inflows to 32 developing countries, using data from 1982 to 2008. The results from the panel regression methods shows that good infrastructures, large market size, less labour cost and more reserves affect FDI inflow positively in developing countries. Country with large market size attracts more FDI and countries with low labour cost also motivate MNC's to invest in a country where wage rate is low. More reserves and good infrastructures have positive impact on FDI inflow to host country. But, openness does not have impact on FDI inflow. Liargovas and Skandalis (2012) use a sample of 36 developing countries across the world namely 12 from Latin America, 10 Asian, 4 African, 4 Commonwealth of Independent States and 6 Eastern European countries over the period 1990- 2008. They study the relationship between FDI, trade openness, exchange rate, nominal GDP, GDP per capita and political risk. Results from the fixed effects models show that exchange rate stability, market size, political stability, trade openness affect FDI inflow positively. Trade openness has a positive long run impact on FDI inflow. A study by Mohamed et al. (2013) explores the relationship between FDI, domestic investment and the economic growth of Malaysia during the period 1970–2008. By employing the vector error correction model, they conclude that there exist bidirectional causality between domestic investment and economic growth but none was found between FDI inflows and economic growth of Malaysia in the long run. On the other hand, a crowding-in effect between FDI inflows and

domestic investment is observed in the short run. More recently, Abbas and Mosallamy (2016) examine the determinants of FDI flows for the period 2006 to 2013 for Middle East and North Africa. Applying the panel data regression with time series data for these emerging countries, they find that human capital and infrastructure were negative and significant, while lagged FDI, and market openness were positively and significant determinants of FDI. This positive relationship of market openness and lagged FDI to FDI flows confirms the market imperfections and eclectic theory that FDI in the MENA region are market based and agglomeration exists. Political stability and availability of resources were both found to be insignificant.

3. MAURITIAN ECONOMY

Despite the inherent constraints of a small island economy, Mauritius has achieved remarkable economic success over the years. The Mauritian economy transitioned from an agrarian to knowledge based economy, due to FDI. In 1970, agriculture accounted for about 16 percent of GDP and one-third of total employment. FDI inflows started in 1987. In 1980, the ratio of inward FDI to real GDP was 2.2 percent but it rose considerably and reached 6 percent in 1990. In order to attract FDI in Mauritius, the government offered a wide range of fiscal incentives to investors namely including duty-free imports of machinery, raw materials and other inputs, substantial tax holidays, subsidized power rates and factory space, free unlimited repatriation of profits and dividends, and access to credit on preferential terms. Following the implementation of the Export Processing Zone (EPZ) Act, many investors from Asia established textile factories in Mauritius to benefit from preferential access to the European market. Investment in the export sector increased due to the availability of relatively cheap semi-skilled labour and very flexible labour laws. FDI in the EPZ led to industrial diversification, export development, employment creation and growth, hence, helping the economy to emerge from backwardness to a modern, dynamic and technologically advanced economy with higher per capita incomes and greater equity. Thus, FDI inflows are accompanied by new business ideas, technologies, and managerial skills. Few years later, the EPZ has been victim of its own achievement, as the manufactured exports were more successful in attracting FDI flows. In 1993, manufacturing FDI accounted 36 percent of total FDI while in 1998 it stood at 8 percent of total FDI flows. Thus, the manufacturing sector was the main sector attracting FDI in the 1980s and 1990s. In 2000, the agriculture's share of GDP stood at 6.8 percent while the manufacturing sector accounted for 21.6 percent of GDP. Total employment in agriculture sector was 11.5 percent while 29.4 percent in the manufacturing sector. Thus, the manufacturing sector has expanded to become an important pillar of the economy, but some years later, this sector has witnessed a decline in FDI inflows as most of the inflows were directed to emerging services i.e. the tertiary sector namely tourism sectors, financial intermediation and real estate. In 2008, 35 percent of FDI inflows were directed to tertiary sectors and the largest FDI inflows came from developed economies namely United Kingdom, France and the United States. Other emerging sectors such as seafood hub and aquaculture, land-based oceanic industry, ethanol production, spinning, renewable

energy, knowledge hub, environment and clinical trials, were promoted to attract more FDI inflows. The ratio of inward FDI to real GDP was in 2010 was at 24 percent, while in 2011, the ratio was 23 percent. In short, Mauritius' FDI inflows stock increased from US\$ 658 million in 2001 to US\$ 2,583 million in 2011. The Bank of Mauritius revealed that FDI stock for Mauritius stood at US\$ 3,705.6 million in 2015 while FDI inflow flow was US\$ 208 million in 2015. According to the latest figure, with a high levels of economic freedom, low level of political risk, low taxes rates stable financial sector and transparent macroeconomics policies, FDI flows have reached US\$ 235million in 2016 and are expected to increase further to US\$ 252 million in 2017.

4. METHODOLOGY

A general model will be considered. The dependent variable in our model is the FDI and the regressors include the exchange rate, gross fixed capital formation, inflation, infrastructure quality, deposit saving rate, political risk, secondary education enrolment rates and trade openness. Using time series data on Mauritius covering the period 1975 and 2015 obtained from Statistics Mauritius, the Bank of Mauritius and the International Monetary Fund's as well as the International Financial Statistics, the regression is conducted in the form of Ordinary Least Squares (OLS) analysis. The table below described the variables used.

Table 1: Variables Description

Variable name	Notation	Description of Variables
Foreign Direct Investment	FDI	Capital investment (other than portfolio investment) made to acquire a long term controlling interest in a firm operating in another country other than that of investors' country. Annual FDI data in MUR million is used.
Exchange rate	EXC	This measures the price of one currency in terms of another currency. A high level of volatility can be disruptive to exports and investment. In this study, the average buying and selling of Mauritius (Ruppee) to US (Dollar) is used, and a negative sign is expected.
Globalisation	GLO	Globalisation indicates the degree of economic openness and is considered to be one of the pull factors that influence FDI flows to host countries. The ratio of trade to GDP (sum of imports and exports divided by GDP) is used as proxy for trade openness and a positive sign is expected.
Gross domestic fixed capital formation	GDFCF	GDFCF usually includes land improvements, plant, purchases of machinery and equipment, construction of roads, railways and infrastructures such as schools, offices, hospitals and industrial buildings. An increase in GDFCF is likely to encourage investors to invest given that more facilities will be provided for a better return, thus a positive sign is expected.
Gross Domestic Product per capita	GDP	This is usually employed to denote market size, which is indicative of the level of economic activity. If the growth rate has a large market size, it indicates a prosperous business climate and hence serves as a factor attracting foreign investors, thus a positive sign is expected.
Inflation	INF	This indicates the economic stability of the country. It measures the rate of change of the price level and the purchasing power of the host country currency. High inflation rate imply economic instability which leads to negatively affect economic growth and FDI, thus a negative sign is expected.
Infrastructure quality	INS	Infrastructure increases the productivity of investments, facilitates production and reduces operating costs. Government expenditure on transportation and communications or telephone mainlines (per 1000) can be used as proxy for infrastructure. In this study, we will use fixed telephone lines per 100 inhabitants and a positive sign is expected.
Interest rate	INT	In this study, the principal interest rates for saving deposit are used as proxy for return on investment. FDI will flow to countries that pay a higher return on capital, which leads to a higher level of productivity and economic growth, thus a positive sign is expected.
Political Risky	POL	Political risk is usually measured by the probability of a change of government, as well as political violence as measured by the sum of frequency of political assassinations, violent riots and politically motivated strikes. The political stability index is used as a proxy and a negative sign is expected.
Secondary Education enrolment rates- Human Capital	SEC	Foreign direct investors are also concerned with the quality of the labour force in addition to its cost. A more educated labour force can learn and adopt new technology faster and is generally more productive, thus higher level of human capital is a good indicator of the availability of skilled workers. This study uses the gross enrolment ratio 12-19 years as a proxy for human capital and a positive sign is expected.

As part of the methodology design, the following model is set up according to Asiedu (2002).

FDI = f (Exchange rate, Globalisation, Gross domestic fixed capital formation, Gross domestic product, Human capital, Inflation, Infrastructure quality, Interest rate, Political risk)

For analytical purposes and to conduct various tests using STATA, we have transformed the function into an econometric model which can be described as follows:

$$\text{Infedit} = \alpha + \beta_1 \text{Inexc } t + \beta_2 \text{Inglot} + \beta_3 \text{Ingdscft} + \beta_4 \text{Ingdpt} + \beta_5 \text{Ininf} + \beta_6 \text{Ininst} + \beta_7 \text{Inint} + \beta_8 \text{Inpolt} + \beta_9 \text{Insect} + \mu t$$

Where (α) is the constant coefficient while $\beta_1, \beta_2, \dots, \beta_9$ are the estimated coefficients on the independent variables and μt , is the error term. A Log-Log model has been used for its simplicity and ease of analysis. Indeed, it measures the percentage change of FDI (Y variable) given a percentage

change in the macroeconomic factors (X variables). The slope coefficients assess the elasticity of FDI in respect with the other macroeconomic determinants.

In order to execute the empirical design, the nature of the data distribution is examined using the descriptive statistics. Second, the time series property of each variable is investigated through the Augmented Dickey-Fuller (ADF) test, Phillips-Perron (PP) and the Kwiatkowski-Phillips-Schmidt-Shin (KPSS). It is essential to check for stationary since non-stationary data may lead to spurious results, thus all the three tests have been done to have a more precise result. The third step is to select the optimum lag in order to avoid the use of ineffective model. The model with the lowest Akiake Information Criteria (AIC) is used to select the optimum lag. Fourth, the diagnosis tests (autocorrelation, homoscedasticity, normality tests and stability condition test) are performed in order to solve any

spurious regression problem. We used the Lagrange Multiplier test to detect the presence of autocorrelation while the Breusch–Pagan–Godfrey test is used to reveals homoscedasticity of the distribution. Further, the test for normality in residuals in undertaken using three tests namely the Jarque Bera test, Skewness test and the Kurtosis test. The stability test was performed to check the stability condition of the VAR. Fifth, the Johansen-Juselius procedure is implemented to detect the cointegrating relationship among variables. The cointegration analysis is used to examine the long run relationship between the variables. If the residuals are stationary [I (0)] with a zero mean then the variables are cointegrated and these

residuals are used to build up the Error Correction Model (ECM). The ECM is used to represent the long run (static) and short run (dynamic) relationships between FDI and other variables. Finally on evidence of cointegrating relationship, a Vector Error Correction Model (VECM) is estimated to model the long run and short term dynamics. The purpose of VECM model is to indicate the speed of adjustment from the short run equilibrium to the long run equilibrium state. The greater the coefficient of the parameter the higher the speed of adjustment of the model from short runs to long run. According to our empirical design, table 2 summarises the descriptive statistics, as reported below.

Table 2: Descriptive Statistics

	Observations	Mean	Median	Maximum	Minimum	Std. Dev.
LNFDI	41	2.733668	2.729974	4.309055	0.778151	1.042533
LNEXC	41	1.294813	1.257198	1.545579	1.075912	0.164740
LNGDFCF	41	4.132956	4.287802	4.898643	3.051538	0.613041
LNGDP	41	4.563769	4.551426	5.443698	3.583085	0.547879
LANGLO	41	-0.074710	-0.078480	0.058326	-0.209446	0.064724
LNINF	41	0.799031	0.826075	1.623249	-0.221849	0.319021
LNINS	41	1.046317	1.130334	1.491362	0.397940	0.398630
LNINT	41	0.823921	0.903090	1.079181	0.469822	0.175725
LNPOL	41	-0.030715	0.000000	0.017033	-0.236572	0.059325
LNSEC	41	1.733983	1.718445	1.852874	1.557454	0.089386

Source: Computed, 2017

The above represents data for 41 consecutive years starting from 1975 to 2015. Over the last 41 years it has been observed that political risk has the lowest mean value and the highest mean was found to be 4.563769 for GDP per capita. Additionally, it has been observed that the highest diversion from the mean value was of +1.042533

for FDI and the variable that deviates the less from its mean value was political risk with a value of + 0.059325. The unit root tests were conducted at 1% and 5% significance level. ADF and PP tests are conducted and are complemented with KPSS to ensure robustness of the results. The results for ADF, PP and KPSS tests are presented below.

Table 3: Unit Root Tests

	ADF- Level		ADF- First Difference		PP- Level		PP- First Difference		KPSS- First Difference		Conclusion
	Constant + Trend	Constant	Constant + Trend	Constant	Constant + Trend	Constant	Constant + Trend	Constant	Constant + Trend	Constant	
LNFDI	3.73102* -	-0.68571	-6.60063***	-6.71567***	3.6821** -	-0.77024	-6.97949***	-7.092***	0.050609***	0.050641***	I(1)
LNEXC	-2.31098	-0.30607	-6.60293***	-6.69306***	-2.30443	-0.15573	-6.68793***	-6.7937	0.098825***	0.110057***	I(1)
LNGDFCF	-0.09052	-2.07982	-5.81959***	-2.5233	-0.60677	-1.79174	-5.97778***	5.56074** -	0.0079059** *	0.304768***	I(1)
LNGDP	-2.04877	-0.90922	-5.65129***	-5.72515***	-2.23942	-0.9279	-5.65102***	5.72481** -	0.064607***	0.069125***	I(1)
LANGLO	-2.62506	-2.3856	-7.26379***	-7.39407***	-2.8582	-2.42551	-7.37653***	7.45566** -	0.078798***	0.076083***	I(1)
LNINFL	3.87153* -	-3.2159**	-6.16027***	-6.23744***	-3.47355	-3.05941	-11.7884***	11.6847** -	0.280081	0.319130***	I(1)
LNINS	-1.14452	-1.56423	-3.97176**	-3.74306***	-0.9696	-1.30333	-3.96744**	3.73686** -	0.130061***	0.207353***	I(1)
LNINT	-2.38897	-0.97956	-5.37317***	-4.88771***	-2.62743	-1.25183	-6.24713***	-4.7461***	0.213202***	0.428417***	I(1)
LNPOL	-0.1271	2.548702	-6.11523***	-1.47459	4.16321* -	-3.45677**	-12.0526***	12.7102** -	0.191085***	0.209936***	I(1)
LNSEC	-2.57211	-1.44224	-4.37341***	-4.28098***	-2.39638	-1.71805	-4.30403***	4.20707** -	0.082326***	0.175477***	I(1)

Source: Computed, 2017

The results indicate that at level form all the variables could not be rejected as the null hypothesis of the unit root were not stationary. Given that, all the variables under ADF and PP tests are found to be non-stationary in levels, as a result the variables have been differenced once to check their stationarity. At first differencing ADF and PP test statistics

reject the null hypothesis of unit root. The KPSS test also confirms that all variables are stationary at first difference. Therefore, all variables depict the same order of integration, i.e. I (1) behaviour. Thus, the lag order selection criteria is applied, as reported in the table below.

Table 4: VAR Lag Order Selection Criteria

Included observations: 39						
Lag	LogL	LR: sequential modified LR test statistic	Final prediction error	Akaike information criterion	Schwarz information criterion	Hannan-Quinn information criterion
0	381.3424	NA	2.54e-21	-19.04320	-18.61665	-18.89016
1	676.8737	424.3527	1.31e-25	-29.07045	-24.37835*	-27.38696
2	827.0847	138.6563*	3.05e-26*	-31.64537*	-22.68773	-28.43144*

**indicates lag order selected by the criterion*

Source: Computed, 2017

From the above table, it has been estimated that the number of lag to be used to test stationarity of the residuals

to be zero is lag 2. Further, we proceed with the diagnosis tests as reports below.

Table 5: Diagnosis Tests

Type of test	Test statistics	Conclusion
Heteroscedasticity (Breusch-Pagan / Cook-Weisberg test)	Chi2(1) = 2.82 Prob > chi2 = 0.0934	Errors are homogeneous
Serial correlation (Breusch-Godfrey LM test)	Chi2(1) = 0.023 Prob > chi2 = 0.8804	No serial correlation
Normality	Jarque-Bera=35.170 with Prob > chi2 = 0.01922	Errors are normally distributed

Source: Computed, 2017

From the above table, the Breusch-Pagan-Godfrey test reveals homoscedasticity of the distribution. Likewise, the Breusch-Godfrey serial correlation test reveals no serial correlation in the variables. Further the result for normal distribution of each variable shows that the probability for joint for Jarque- Bera is less than 5%, therefore we conclude that the errors are normally distributed. To confirm

the diagnostic checks, the residuals for this model were plotted and the diagram shows that the VAR model is stable since all Eigen values lie inside the unit circle. Thus, the residuals were of zero mean and constant variance. We further proceed with the stability test of the VAR, as reported in table 6.

Table 6: Results for Stability of VAR

Root	Modulus
0.9512386 + .03965497i	0.952065
0.9512386 - .03965497i	0.952065
0.8858416 + .1985633i	0.907823
0.8858416 - .1985633i	0.907823
0.07409231 + .8589178i	0.862108
0.07409231 - .8589178i	0.862108
0.7328769 + .4391987i	0.854403
0.7328769 - .4391987i	0.854403
0.567775 + .5784842i	0.810563
0.567775 - .5784842i	0.810563
-0.75079	0.75079
-0.1545817 + .6980045i	0.714917
-0.1545817 - .6980045i	0.714917
0.1442827 + .6984127i	0.71316
0.1442827 - .6984127i	0.71316
-0.08446231 + .5605841i	0.566911
-0.08446231 - .5605841i	0.566911
-0.453016 + .3254965i	0.557827
-0.453016 - .3254965i	0.557827
-0.1814428	0.181443

No root lies outside the unit circle.
VAR satisfies the stability condition.

Source: Computed, 2017

As shown in table 6, the modulus is less than one, thus the VAR satisfies the stability condition. Thus the results from the impulse response functions are highly reliable.

Consequently, the Johansen-Juselius approach is implemented to detect the cointegrating relationship among variables.

Table 7: Johansen co-integration

	Null hypothesis	Alternative hypothesis	Test statistics	Critical value (5%)	Decision
Trace of the stochastic matrix	r=0	r=1	430.2311	233.13	Reject H0
	r≤1	r=2	318.0515	192.89	Reject H0
	r≤2	r=3	242.8033	156.00	Reject H0
	r≤3	r=4	175.6118	124.24	Reject H0
	r≤4	r=5	119.0700	94.15	Reject H0
	r≤5	r=6	80.2252	68.52	Reject H0
	r≤6	r=7	50.7173	47.21	Reject H0
	r≤7	r=8	26.7803	29.68	Accept H0
Maximum eigenvalue of the stochastic matrix	r=0	r=1	112.1795	62.81	Reject H0
	r≤1	r=2	75.2482	57.12	Reject H0
	r≤2	r=3	67.1916	51.42	Reject H0
	r≤3	r=4	56.5418	45.28	Reject H0
	r≤4	r=5	38.8448	39.37	Accept H0

Source: Computed, 2017

Table 7 presents the result of Johansen co-integration test both at the trace and maximum eigenvalue levels. According to the results, the trace test detect 7 cointegrating equation while the maximum eigenvalue statistics detect four cointegrating relationship at the 5%

level. We conclude that this data exhibits seven cointegrating vector, thus we confirm the presence of a long-run equilibrium relationship among variables. As a result, the vector error correction model is estimated.

Table 8: Vector Error Correction Model (VECM)

Variable	Coefficient	Std. error	T- statistics	Prob.
ECM (-1)	-1.6887137	0.8429926	-2.003237	0.045**
DLNFDI(-1)	0.31520281	0.5721579	0.5509018	0.582
DLNFDI(-2)	-0.24269131	0.45061	-0.538584	0.590
DLNEXC(-1)	-10.990058	5.906799	-1.860578	0.063*
DLNEXC(-2)	-5.3856003	4.063325	-1.325417	0.185
DLNGDFCF(-1)	0.37385397	2.243559	0.1666343	0.868
DLNGDFCF(-2)	-0.93274085	1.893809	-0.4925211	0.622
DLNGDPPER(-1)	-0.79136799	0.945897	-0.8366323	0.403
DLNGDPPER(-2)	-0.85614111	1.03266	-0.829064	0.407
DLNGLO(-1)	3.7372366	4.582278	0.8155848	0.415
DLNGLO(-2)	0.22091563	3.392713	0.0651147	0.948
DLNINF(-1)	1.4306279	0.7713185	1.854782	0.064*
DLNINF(-2)	0.626973	0.513391	1.221239	0.222
DLNINS(-1)	0.49998018	3.529159	0.1416712	0.887
DLNINS(-2)	-2.3759109	2.796246	-0.8496787	0.396
DLNINT(-1)	-0.13291146	1.574915	-0.0843928	0.933
DLNINT(-2)	1.1714758	1.513304	0.7741182	0.439
DLNPOL(-1)	-3.119103	3.165808	-0.9852471	0.325
DLNPOL(-2)	-2.1552801	2.514651	-0.8570893	0.391
DLNSEC(-1)	18.171333	13.52536	1.3435	0.179
DLNSEC(-2)	10.849749	9.643197	1.12512	0.261
C	0.0046743	0.203711	0.0229458	0.982

R²=0.8158

R² adjusted= 0.80097

DW= 1.893604

F-statistic= 12.93267

Prob (F-stat)= 0.000396

Number of observations = 38

***significant at 10%, ** significant at 5%, ***significant at 1%**

Source: Computed, 2017

From the above table, the estimated coefficient of the error correction term is negative (-1.6887) as expected and statistically significant. It can be seen that one period lagged of two variables namely exchange rate and inflation rate affect FDI. Moreover, all the variables in two period lagged are insignificant. The coefficient of determination (R²) at 0.8158 shows a moderate explanatory power of the model, while the adjusted R² is 0.8010, which implies that

about 80.10% of systematic variations in FDI is jointly explained by all the explanatory variables while 19.90% of the systematic variations in FDI was left unexplained and this is captured by error term. The F-statistics of 12.9327 suggest that good interactive feedback effect exists within the model while the Durbin Watson Statistics of 1.8936 indicates a good fit and an absent of autocorrelation. One period lagged of exchange rate affects FDI negatively,

meaning that higher exchange rate volatility will decrease FDI flow by 10.99%. This negative relationship may be explained by a high level of importation as Mauritius is import dependent economy. In addition, the depreciating values of the local currency during the period contribute to the negative effect. This finding is in accordance with the findings put forward by Benassy et al (2000) and Cleeve (2008), where they found that a depreciation of the currency of the host country increases the relative wealth of foreign entrepreneurs, thus this may increase the attractiveness of the host country for FDI. But, this opposed the work of Ezirim et al (2006) which stated that exchange rates affect FDI positively in Nigeria. On the other hand, one period lagged of inflation affects FDI positively in Mauritius. For every 1% increase in inflation rate there was an increase in FDI flow by 1.43%, *ceteris paribus*. The rise in inflation rate encourages foreign investors to invest in Mauritius because investors will benefit from higher profit margin. This finding was also found in the work of Awan, Khan and Uz Zaman (2010), where inflation rates has positive significant effect on FDI inflows in Pakistan. Similarly, Zaman et al. (2006) and Ezirim et al (2006) also confirm the fact that inflation rate affect FDI inflows positively in Pakistan and Nigeria respectively.

5. CONCLUSION

The objective of this study was to analyse the determinants of FDI in Mauritius. This has been done using an econometric model based on annual time series data for Mauritius over the period of 1975-2015. To examine this impact, co- integration and error correction model is used. Since all variables are stationary at first difference and the data are co integrated, we therefore confirm a long run equilibrium relationship among variables. Therefore, a VECM is performed. The econometric analysis reveals that macroeconomic variables (inflation rates and exchange rate) are among the major and important factor that determine the inflow of FDI in Mauritius over this period of time. According to our analysis, one period lagged of two variables namely exchange rate and inflation rate affect FDI at 5% significant level, while none were significant in two periods lagged. The results from the econometric analysis confirmed the results of the existing standard literature where it was established that interest rate and exchange rates played a significant role in stimulating FDI. In the light of the observations elaborated in this study, it can be concluded that interest rate and exchange rate are an essential requisite for Mauritius to regenerate its economy in order to be competitive worldwide. It is firmly believed that Mauritius should take bold measures to increase its FDI inflows. In the wake of global economy, the country has gradually moved from an agro based economy to an economy centred on services. The service sector has been moving into higher value added and sophisticated services by intensifying growth into sectors such as education, financial, information technology services and medical tourism. To achieve growth in Mauritius, greater skills development will be required, as well as an open policy towards absorbing FDI and qualified labour from abroad. This will be beneficial to the labour- and knowledge-intensive sectors of Mauritius. The government should try to redirect FDI inflows in productive sectors of the economy. Due to its simplified and low tax regime, regardless of

existing restrictions, Mauritius became an investment hub for inward FDI in Africa, but still the authorities need to update to the country's investment strategy by creating of an IP rights enforcement authority, consolidating social justice, designing an investment code and renewing the content of the existing bilateral investment treaties. Reforms on doing business should be implemented in order to improve investment climate to world standards. Mauritius should adopt policies to reduce more trade barriers, strengthen export promotion activities and deals with non-tariff measures in order to achieve a surge in FDI inflows. The government should continue to diversify the export and tourism markets towards Asia and Africa. Thus, greater openness is one route for Mauritius to catch up with the rest of the world's developing countries in attracting FDI. These measures will allow FDI to flow in more easily which attract foreigners who can contribute to flourishing the country. Moreover, this research are subject to some limitations, namely the selection of explanatory variables was constrained by data availability and time frame. Thus, there is a need for further research in this area, especially by taking accounts other important determinants of inwards FDI such as corporate tax, external debt, money supply and total debt service.

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