The Dynamic Relationship between Foreign Direct Investment Inflows and Interest Rate in Sri Lanka

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Abstract

This study aims to identify the dynamic influence and relationship between Foreign Direct Investment (FDI) and interest rate in Sri Lanka over the period 1978 to 2020. The Augmented Dicky-Fuller (ADF) and Phillips Perron (PP) unit root tests have been used to test the order of integration. This study suggested that all variables are integrated with order zero and one and all lag length selection tests. Therefore, this study used the ARDL model for the analysis. According to the bound test, F statistics is greater than the upper bound value. Therefore, this study confirmed that there is co integration relationship between the foreign direct investment inflows and other explanatory variables. A negative and significant error correction coefficient (-1.289) of FDI inflows reveals that 128% disequilibrium is corrected each year which implies that FDI moves downward towards long-run equilibrium. This study found that there is no significant relationship between the interest rate and FDI inflows in the long run and a negative and significant relationship in the short run. Therefore, this study suggests that the government of Sri Lanka has to consider developing a monetary policy on maintaining the balance of interest rate and exchange rate. Because of the currency depreciation, the exchange rate negatively influences FDI.

Keywords: *Exchange rate, Foreign Direct Investment, GDP Growth, Interest rate*

Introduction

According to the World Investment Report, FDI is defined as an investment involving a long-term relationship and reflecting a lasting interest and control by a resident entity in one economy (foreign direct investor or parent enterprise) in an enterprise resident in an economy other than that of the foreign direct investor (FDI enterprise or affiliate

enterprise or foreign affiliate) (Duce and B. D. E, 2003). For a country, foreign investments come in several forms. But, portfolio investment, foreign loans and foreign direct investment are the main types of it. Therefore, FDI plays an engine of rapid growth and development of developing and emerging countries than developed countries. It helps to promote the host country's economic growth such as labour training, market development, financial inflow, technology transfer and skills. As well, it can minimize the shortages of financial resources and technology and contribute to human skill development that would lead to economic growth (Faroh & Shen, 2015).

An interest rate refers that the percentage of principal charged by the lender for the use of its money (AMADEO, 2019). An interest rate is a key tool in the monetary policy of a country and it is the most related variable to inflation and investment. As well as, the interest rate is determined in the money market by the demand for money and money supply. Keynes said that as a result of the increase in income for any reason, when demand for money increases, the interest rate goes up and vice versa. But, given the demand for money, an increase in the money supply causes a decrease in the interest rate and vice versa (Dwivedi, 2005).

Moreover, the interest rate is one of the key determinant factors of FDI. Generally, lower interest rates induce investors to invest more in economies. Because lower interest rates minimize the cost of production and maximize the higher returns. Consequently, better investment returns, security in the form of lower interest rates and a better business environment create an opportunity for high investment in an economy.

Nowadays, FDI is seen as the main key to the global economy and an essential source of socio-economic development. Still, advanced industrialized countries attract 59 percent of FDI inflows like the US and UK, while developing countries are attracting only 14 percent share of FDI, even though it supports the sustainable growth in developing countries.

FDI flows to ASIAN countries rose from $123 billion in 2016 to $137 billion in 2017. Inflows from Indonesia increased from $3.9 billion in 2016 to $23.1 billion, flows to Thailand tripled to $9.1 billion and flows to the Philippines rose by 21 percent (ASIAN Investment Report, 2018).

In recent years, FDI inflows to Sri Lanka have increased steadily. Inflows to Sri Lanka reached USD 1.6 billion in 2018 by the ASEAN countries including China, India, and Singapore. According to the World Bank's Doing Business Index Report', Sri Lanka was ranked 100th out of 190 countries. The country has aimed to be achieved the 70th rank by 2020. FDI stock exceeds USD 12.7% billion in 2018. As well, China, Hong

Kong, India and Singapore have invested a large amount in 2018. Hence, the government expects to increase FDI to more than triple to USD 4 billion by 2022 (Doing Business Index, 2019).

Even though, nowadays Sri Lanka faces some struggles in attracting FDI inflows. Now, there is peace and security. But, these are only not sufficient conditions to attract the FDI inflows to Sri Lanka. But, ensuring an attractive investment climate, macroeconomic policies, good governance, economic stability, the guarantee of property rights, rule of law and absence of corruption and especially, economic policies and political stability are preconditions to attract FDI (Sanderatne, 2011). As well as, the real interest rate also determines the investment level. Because, changes in interest rate directly affect investment, output and employment. Consequently, real GDP decreases and creates inflation through price changes.

Unsustainable external debt has increased. This is because of the absence of enough exports and FDI. Attracting more FDI requires several ingredients such as political stability, ensuring property rights, a reasonable tax regime and less corruption and interest rate. Further, most of the FDI inflows are coming for infrastructure development projects. Hence, Sri Lanka must attract FDI inflows to the manufacturing and service sectors. Because, that only improve the tradable sectors, helps to increase the exports and leads to creating job opportunities (Dailymirror, 2019).

High-interest rates discourage FDI inflows. Because a high-interest rate increases the cost of investment. Therefore, investors need more funds over their funds to invest in new projects. Therefore, lending interest rates of a country are very sensitive and cost for foreign investors. Hence, high lending interest rates may increase the cost of capital investment in projects. Finally, it discourages FDI inflows (Jayasekara, 2014). According to the CEIC report, Sri Lanka Bank Lending Rate was at 16.380 % in April 2022. This lending rate increased from 9.710 % in Mar 2022.

Further, the COVID-19 pandemic employed significant downward pressure on global trade and the global economy. It leads to a decline in merchandise trade, foreign direct investment (FDI) flows, and tourism. The Sri Lankan economy has been impacted by the fluctuation of external sector performance. FDI flows saw a decline in 2020 by 42% 2020 compared to 2019. It affects capital flows such as tourism, migration and remittance flows. Therefore, this research seeks to find the relationship and impact of interest rates on FDI inflows in Sri Lanka and to make some policy suggestions to improve the FDI inflows.

Literature Review

Bett (2017) identified the relationship between foreign direct investment and GDP, interest rate, exchange rate and inflation in Kenya by using the descriptive analysis and multiple linear regression model. This study found that interest rate, economic growth, inflation rate and the exchange rate had a strong correlation with FDI. Therefore, the model was fit to explain the effects of interest rate on FDI inflows. However, this result revealed that individually, interest rate, economic growth, exchange rate and inflation rate are not significant determinants of FDI inflows in Kenya.

The influence of interest rate on FDI investigated by using the Ordinary Least Square method in Sierra Leone for the period 1990-2016. The results showed that interest rates had a significant impact on FDI inflows and discovered that trade openness and GDP growth are the major determinants of FDI (Fornah & Yuehua, 2017).

Thilakaweera (n.d.), identified the long-run relationship and causality between real per capita GDP, FDI and the level of infrastructure in Sri Lanka. These empirical results confirmed the unidirectional causality from the level of the infrastructure to FDI.

Jayasekara (2014), revealed that GDP growth rate, inflation, infrastructure quality, lending interest rate, labour force, exchange rate, and corporate income tax were significant determinants of FDI in Sri Lanka from 1975 to 2012. Further, they are directly associated with the cost of production for investors.

The relationship between the FDI inflows and interest rate is examined using the Vector Auto Regression technique over the period 1986 to 2012. This study suggests that the interest rate of Thailand, Indonesia, and Malaysia have a negative relation to FDI (Siddiqui and Aumeboonsuk, 2014).

Quazi and Mahmud (2004), found that economic freedom, economic openness, economic prosperity, human capital and incremental legged changes in FDI significantly increase FDI inflows in South Asia, while political instability significantly decrease it from 1995 to 2000.

Trade openness and exchange rates are the key determinants of FDI inflows have positive significant signs in the Sierra Leone economy found by using econometrics techniques from 1985 to 2012. Further, this study found that inflation, GDP and interest rate are insignificant variables causing the variability of FDI flows. Therefore, based on the acceptance of the null hypothesis of this study, this study concluded that interest rate does not affect FDI inflows in Sierra Leone (Faroh and Shen, 2015).

Anna et. al (2012), tested the hypothesis that a high-interest rate has a positive impact on FDI inflows in Zimbabwe by using the OLS

approach. This paper identified that interest rate had no significant impact on FDI inflows. Therefore, it cannot be used for policymaking purposes. And also, this study discovered that the GDP, exchange rate, and inflation are also determinants of FDI inflows and revealed that the political instability, war and failure to observe domestic rights are the risk factors and they are the major determinants of FDI in Zimbabwe.

Methodology and Data Analysis

Data Collection

This study is explained through secondary data which are collected from secondary sources. The data used in this study are annual time series data which covers the period from 1980 to 2017. The GDP growth rate, exchange rate and foreign direct investment data were directly obtained from the annual report of the Central Bank of Sri Lanka. The data on interest rates were collected from the International Monetary Fund e-library and a popular statistics database website called Knoema. The inflation data was obtained from the International Monetary Fund e-library and International Financial Statistics.

Econometric Models

To obtain reliable regression results, it is necessary to examine the stationarity or non-stationary of the time series variables to avoid spurious regression in the model. Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests were used to determine whether the time series data were stationary or not. When time-series variables are non-stationary and used for the analysis of findings it may give spurious results. ADF and PP tests were applied to variables to distinguish if these variables were stationary or non-stationary at the level. The first difference is used When variables are non-stationary at the level.

Auto-Regressive Distributed Lags (ARDL) Bounds test was employed to find co-integration between variables in this study. The ARDL bounds testing approach to co-integration was proposed by Pesaran et al. (2001). The long-run relationship is examined using the values of bounds test.

ARDL test is performed when all variables are not in the same order of integration. That means variables are integrated in mixed order [I (0), I (1)] or a combination of both orders. The ARDL method allows the variables to have a different level of optimal lags.

Therefore, the ARDL model was used to investigate long-term relationships and short-term dynamics between foreign direct investment,

interest rate, exchange rate, trade opens, and gross domestic product in Sri Lanka. CUSUM and CUSUM OF SQVARES tests were employed to find the stability.

Model Specification

This study empirically examines the relationship between foreign direct investment and interest rate in Sri Lanka from 1978 to 2020. Where, foreign direct investment is the dependent variable and gross domestic product, inflation, interest rate, exchange rate and trade openness are independent variables. Hence, the econometric model is specified as:

$$\boldsymbol{FDI_t = \beta_0 + \beta_1 GDP_t + \beta_2 INF_t + \beta_3 IR_t + \beta_4 EXR_t + \beta_4 TOP_t + \varepsilon_t}$$

Equation (01)

Where FDI represent the foreign direct investment, GDP shows the gross domestic product, INF denotes the inflation rate, IR represents the interest rate and EXR and TOP denote the exchange rate and trade openness. β_0 is an intercept/slope coefficient, β_1 to β_4 are coefficient parameters to be estimated. Eviews version 10.0 were used to estimate the econometric models.

$$\Delta \boldsymbol{FDI_t = \alpha_0 + \sum_{i=}^{n} \alpha} \quad \sum \quad \sum$$
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Equation (02)

Where: Δ indicates the first difference operator. α0 is constant. α1 to α6 show the short-run dynamic coefficients. $\boldsymbol{\delta}1$ to $\boldsymbol{\delta}6$ are the long-run multipliers. ECM is an error correction model. εt denotes white noise errors. 'n' is the optimal lag length which is selected by the model Schwarz information criterion (SIC) and Akaike Information Criterion (AIC).

The null hypothesis of no co-integration (H0:α1 =α2 =α3 =α4 = α5 =α6) is tested against the alternative hypothesis of co-integration (H1: $\boldsymbol{\delta}$ 1 $\neq \boldsymbol{\delta}$ 2 $\neq \boldsymbol{\delta}$ 3 $\neq \boldsymbol{\delta}$ 4 $\neq \boldsymbol{\delta}$ 5 $\neq \boldsymbol{\delta}$ 6). The bound test is used to determine the long-run relationship. The calculated F-statistic value is compared with critical bound values [lower bound I (0) and upper bounds I (1)]. If the calculated value of F statistics is greater than the upper bound value, the null hypothesis of no cointegration will be rejected against the alternative hypotheses of cointegration. If the calculated value of the F – statistic is smaller than the lower bound, the null hypothesis of no cointegration will be accepted. If values of the F – statistic lies within upper and lower bound values then the null hypothesis may either reject or accept.

Result and Discussion

Variables	ADF Test (Trend)		PP Test (Trend)		Order of Integration
	Levels	First Difference	Levels	First Difference	
FDI	-4.600986 (0.0007)***		-4.582612 (0.0007)		I(0)
EXR	1.557990 (0.9992)	-6.261590 (0.0000)***	1.789825 (0.9996)	-6.260909 (0.0000)***	I(1)
IR	-2.179076 (0.2169)	-6.239919 (0.0000)***	-2.286780 (0.1814)	-7.130068 (0.0000)***	I(1)
GDP	-4.820639 (0.0003)***		-4.820639 (0.0003***		I(0)
INF	-4.612867 (0.0006)***		-5.635895 (0.0002)***		I(0)
TOP	-0.924574 (0.7697)	-5.618687 (0.0000)***	-1.012733 (0.7393)	-5.604481 (0.0000)***	I(1)

Table 1: Stationary Test Result: Augmented Dickey-Fuller (ADF) Test and Phillips Perron (PP) Test

Note: *, **, * indicate 10%, 5% and 1% significant levels respectively**

Source: Computed in E-Views Software

Table 1 results indicate that trade openness, exchange rate and interest rate are non-stationary in their level in both ADF and PP tests. However, they become stationary in the first difference at 5 per cent significance level. At the same time, foreign direct investment, gross domestic product and inflation are stationary at 5 percent in both their level of ADF and PP tests and the first difference. Therefore, this study assumes that FDI, GDP and inflation are also non-stationary in their level and they become stationary in the first difference. Since the order of integration variables is I(0) and I(1), the cointegration Johansen method could not be used. Therefore, the ARDL bound test is performed to examine the short and long-run dynamism of the dependent and independent variables.

Critical Value	Lower Bond Value – I(0)	Upper Bound Value – I(1)
1%	3.06	4.15
5%	2.39	3.38
10%	2.08	3
F-Statistics	4.954134	
K	5	

Table 02: Bound Test

Source: Computed in E-Views Software

Table 02 indicates the critical values of the bound test. Calculated F – statistic (4.954134) is greater than the critical value at 1%,5% and 10% for the upper bound I(1). Therefore, this study confirmed that there is

cointegration. This suggests that there is a long-run relationship between FDI, GDP, inflation, exchange rate, interest rate and trade openness in Sri Lanka.

Constant	GDP	INF	IR	EXR	TOP
-1.139028 (0.1409)	0.089156 (0.0581)*	0.013213 (0.4890)	0.020724 (0.6987)	0.006402 (0.0279)**	0.016439 (0.0925)*

Table 03: Long Run Coefficients

Note: *, **, *** indicate 10%, 5% and 1% significant levels respectively

Source: Computed in E-Views Software

The coefficient of interest rate (-0.174389) has a negative and statistically significant impact on FDI inflows. There is a negative relationship between interest rate and FDI inflows. This implies that a 1 percent increase in the interest rate leads to an approximately 17 percent decrease in FDI inflows in Sri Lanka. The negative effect of interest rate on FDI advocates the view of Bett (2017), Jayasekara (2014) and Faroh et al. (2015) that a decrease in interest rate typically leads to an increase in FDI. Hence, by decreasing the interest rate, the Sri Lankan government can increase the FDI inflow into the country. Unfortunately, exchange rate depreciation against the US dollar in Sri Lanka leads to an increase in interest rates. Consequently, FDI inflows are affected. But, in long run, the interest rate has no significant relationship between the interest rate and FDI inflows.

Similarly, the coefficient of economic growth (0.076043) has a positive and significant impact on Foreign Direct Investment inflows in both the short run and long run. This implies that a 1% percent increase in GDP can lead to approximately 7 percent increase in FDI inflows to Sri Lanka. The coefficient of the exchange rate (-0.000399) has a negative and statistically significant impact on Foreign Direct Investment inflows. There is an inverse relationship between exchange and Foreign Direct Investment inflows. This implies that a 1 percent increase in the exchange rate can lead to approximately a 0.03 percent decrease in FDI inflows. Sri Lanka has a long history of exchange rate depreciation against foreign currencies and thus negatively impacts the inflow of FDI. This outcome has been supported by previous empirical studies by Anna et al. (2012) and Siddiqui & Aumeboonsuke (2014). Trade openness and inflation have no significant impact on FDI inflows.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.022957	0.094056	0.244075	0.8090
(-1)	0.511290	0.165670	3.086192	0.0045
	0.076043	0.032638	2.329844	0.0272**
	0.000422	0.011510	0.036662	0.9710
(-1))	-0.174389	0.053251	3.274867	0.0028***
	-0.000399	0.018154	-0.022001	0.0826*
	0.015985	0.016144	0.990139	0.3306
ECT(-1)	-1.289023	0.241859	-5.329648	0.0000***
R-squared	0.613071			
Adjusted R-squared	0.516338			
F-statistic	6.337803			
Durbin-Watson stat	1.943738			

Table 04: Results of Error Correction Model (ECM)

Note: *, **, *** indicate 10%, 5% and 1% significant levels respectively

Source: Computed in E-Views Software

The Error Correction Term [ECT(-1)] calculates the speed of adjustment between the short-run disequilibrium and the long-run equilibrium. It has a negative sign and it is statistically significant at 1%. The speed of 128% disequilibrium in the short run will be corrected in the long run through the right policy reforms.

Diagnostic	P-value	Results
Normality: Jarque- Bera	10.65487	Error is normally distributed
Serial correlation: Bruesch-Godfrey serial correlation LM test	0.1284	No Serial correlation
Omitted Variable: Ramsey RESET Test	0.1114	No Omitted Variables
Heteroscedasticity: White Test	0.5139	No Heteroscedasticity

Table 05: Diagnostic Test Results

Source: Computed in E-Views Software

The stability of the model was analyzed using statistics of Cumulative Sum of Recursive Residuals (CUSUM). If the statistics were between boundary lines drawn as two separate lines, the null hypothesis will not be rejected. Therefore, this model was stable within 5% critical bounds.

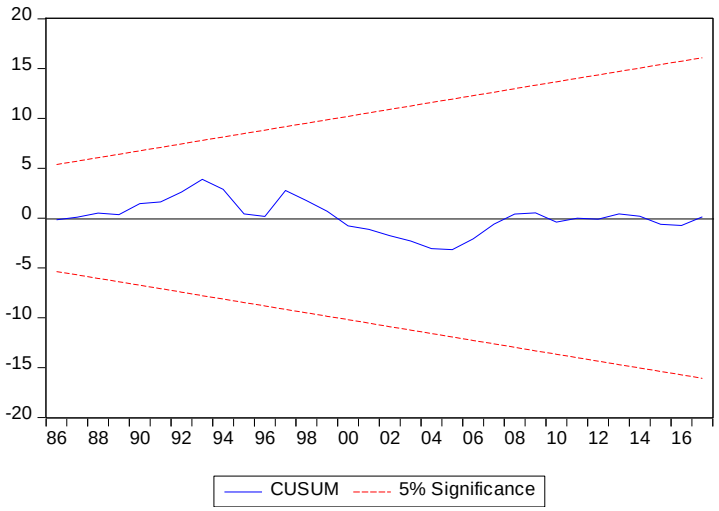

Figure 01: CUSUM Test Results

Conclusion

This study aims to identify the relationships and influence of interest rates on FDI inflows in Sri Lanka by using time series data for the period 1978 to 2020. Based on the literature review this study identified that the GDP, exchange rate, inflation rate, trade openness and interest rate are five important indicators which generally influence the FDI inflows in Sri Lanka. In this study, ADF unit root tests confirmed that all the variables are stationary at the level and their first difference. It is suggesting that all variables are integrated with order zero and one and all lag length selection tests. Therefore, this study used the ARDL model for the analysis.

According to the bound test, F statistics is greater than the upper bound value. Therefore, this study confirmed that there is co integration relationship between the foreign direct investment inflows and other explanatory variables. Long-run results show that GDP growth, trade openness and exchange rate have significant effects on foreign direct investment inflow in Sri Lanka whereas inflation and interest rate do not affect FDI inflows. There is a positive and significant relationship between GDP and FDI inflows. Whereas interest rate and exchange rate have a negative and significant relationship with the FDI inflows. A negative and significant error correction coefficient (-1.289) of FDI inflows reveals that 128% disequilibrium is corrected each year which implies that FDI moves downward towards long-run equilibrium. Finally, it can be concluded that there is a long-run equilibrium between the FDI and five explanatory variables.

Recommendation and Suggestions for Further Research

This study suggests that the government of Sri Lanka has to consider developing a monetary policy on maintaining the balance of interest rate and exchange rate. Because of the currency depreciation, the exchange rate negatively influences FDI. Government should support the private sector to mobilize and utilize the domestic resources for productive investment. Trade openness and reduction in trade barriers are important economic policies in developing countries like Sri Lanka, to motivate domestic economic growth, generate employment and invent new technology through foreign direct investment. Therefore, the Sri Lankan government should implement more liberalization policies to attract foreign investment into the country.

This study suggests that further research be conducted to incorporate human capital, innovation and technologies, political stability, money supply and so on. Because this will support policymakers to know the most suitable determinant to attract the FDI inflows. Researchers can be used the Granger causality test to analyze the various relationships between FDI and other macroeconomic variables.

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