

REDEFINING FDI-GROWTH RELATIONSHIP UNDER LIBERALIZED ECONOMIC POLICIES: EMPIRICAL EVIDENCE FROM SRI LANKA

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Abstract

Economic liberalization complimented with export promoting industrial policies attracts FDI than protective policies. However, the contribution of FDI on growth under liberalized economic policies is not sufficiently analyzed. Therefore, we analyze both long run and short run impact of FDI on economic growth in Sri Lanka with special reference to the post-liberalized period of the country. In addition, we compare the impact of domestic capital and FDI on economic growth in the same backdrop. Sri Lanka entered into liberalized economic policies in 1977 by opening its trade account, and in recent years, the policy has extended to the capital and service accounts, as well. In this study, we employ a linear Auto Regressive Distributed Lag (ARDL) model to assess the relationship between economic growth and FDI by employing annual data over the period of 1978 and 2016. The results suggest a positive impact of FDI on both long run and short run growth. However, the contribution of FDI towards growth in Sri Lanka is far below compared to the domestic investments. Thus, we redefine the growth-FDI relationship as follows. Liberal market policies are the necessary condition to enhance FDI-growth relationship. However, it is not the sufficient condition to facilitate economic growth as the positive impact of FDI on growth is moderated by other socio-economic factors.

Keywords: ARDL Model, Foreign Direct Investment, Economic Growth, Sri Lanka

1. Introduction

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In a seminal paper, Bhagwati (1978) postulated that Foreign Direct Investments (FDI) stimulates economic growth under liberal market policies than protective market policies as the export promoting (EP) strategies, which are complimented in the former, are capable of increasing the volume and efficiency of FDIs. For instance, market oriented policies adopted by Pakistan have led to increase the FDI inflows between 1970 and 2001 (Atique et al., 2004). However, the impact of FDI on growth under liberalized economic policies is not sufficiently analyzed. Moreover, the empirical findings on FDI-growth relationship are ambiguous. Several scholars have argued that FDI positively affects economic growth (Borensztein et al., 1998; Atique et al., 2004; Hoang et al., 2010) while others argue the opposite (Adelegan, 2000; Naveed & Shabbir, 2006; Falki, 2009).

Developing countries pay special attention to attract FDI as a way to overcome resource and skill constraints in those countries (Noorbakhsh et al., 1999). FDI is a way of financing ventures, generating employment opportunities, medium of acquiring skills, borrowing technology invented in other countries, acquiring best practices in management, and accessing overseas markets. Therefore, developing countries can promote growth through the aforesaid benefits of FDI (Sun, 1998; Atique et al., 2004). However, some scholars argue that the impact of FDI on economic growth is affected by the differences in levels of development in the countries (Blomstrom et al., 1992). In contrast, negative effects of FDI on economic growth arise from various channels such as dominating market power of large business conglomerates, environmental pollution, transfer pricing practices, and wider inter-regional economic disparities created by uneven flow of FDI (Sun, 1998; Kok & Ersoy, 2009).

Therefore, the present study intends to achieve three objectives. First, we analyze the long run impact of FDI inflows on economic growth. Second objective is to analyze the impact of FDI on growth in the short run. The third objective is established to compare the contribution of domestic capital and FDI towards economic growth in a liberalized economy.

This study is significant in three ways. First, we emphasize the liberal market policies as necessary condition to enhance FDI-growth relationship. However, it is not sufficient to stimulate economic growth. Second, we occupy a linear ARDL model to analyze the short run and long run effects of FDI on growth, which is a new method to analyze the relationship. Third, we employ endogenously identified break dates to control for structural breaks in data series. Therefore, the findings of the present study are expected to be more robust than the previous literature on FDI-growth relationship.

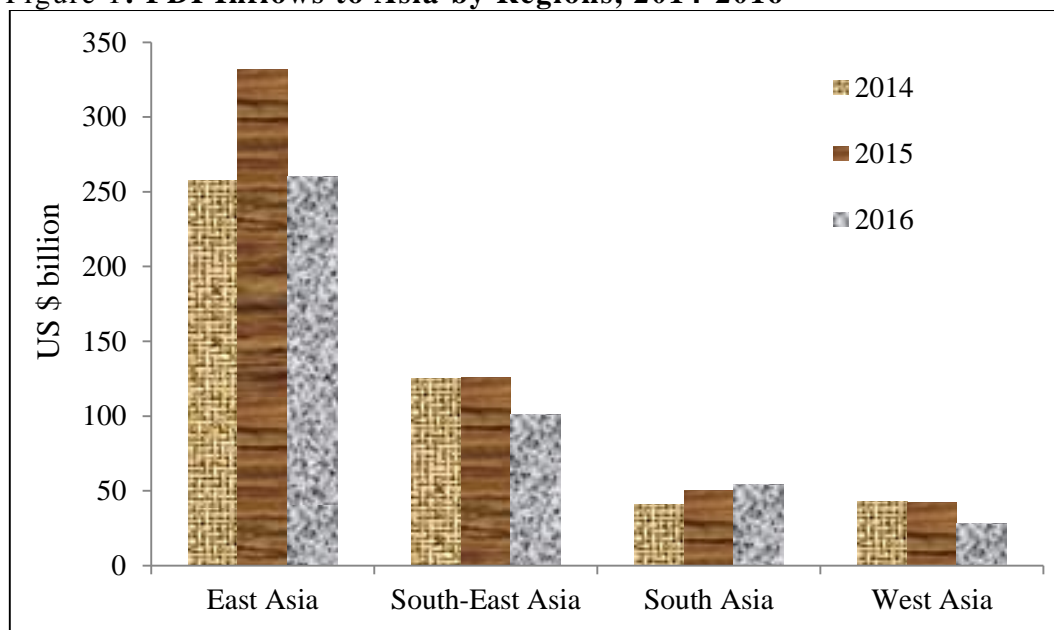
The rest of this paper is organized as follows. Section 2 discusses the behavior of FDI inflows to South Asia, in general, and, into Sri Lanka, in particular. Then, a brief literature review on FDI and its impact on growth are presented in Section 3. Methodology of the research paper is presented in Section 4. Section 5 shows the empirical results derived using a linear ARDL model and followed by concluding remarks in Section 6.

2. Foreign Direct Investment

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 in an enterprise resident in an economy other than that of the foreign direct investor” (United Nations Conference on Trade and Development [UNCTAD], 1999:465). As per the definition, FDI comprises of three components, i.e. equity capital³, reinvested earnings⁴ and intra-company loans.⁵

Despite fluctuations in global FDI inflows, Asia remains the second highest FDI receiving region in the world next to the European region (UNCTAD, 2016 & 2017). Figure 1 exhibits the FDI inflows to Asia by regions from 2014 to 2016. Accordingly, East Asia is ranked number one, followed by South-East Asia, South Asia and West Asia, respectively. Among the four regions, only South Asia has escaped from the sharp decline of FDI during recent years.

Figure 1: FDI Inflows to Asia by Regions, 2014-2016



Source: World Investment Report, 2016 and 2017, UNCTAD

³ “Equity capital is the foreign direct investor’s purchase of shares of an enterprise in a country other than its own (UNCTAD, 1999:465).

⁴ “Reinvested earnings comprise the direct investor’s share of earnings not distributed as dividends by FDI enterprises, or earnings not remitted to the FDI investor. Such retained profits by FDI enterprises are reinvested” (UNCTAD, 1999:465).

⁵ “Intra-company loans are the short/long term borrowings and lending between FDI investors and FDI enterprises” (UNCTAD, 1999:466).

Table 1 shows the net FDI inflows to South Asian countries in 2005, 2010, 2015 and 2016. India dominates the South Asian region by absorbing more than 85 percent of FDI inflows into the region. Sri Lanka has absorbed only 1.7% of the net FDI inflows in 2016.

Table 1: Net FDI Inflows to South Asian Countries (US\$ millions)

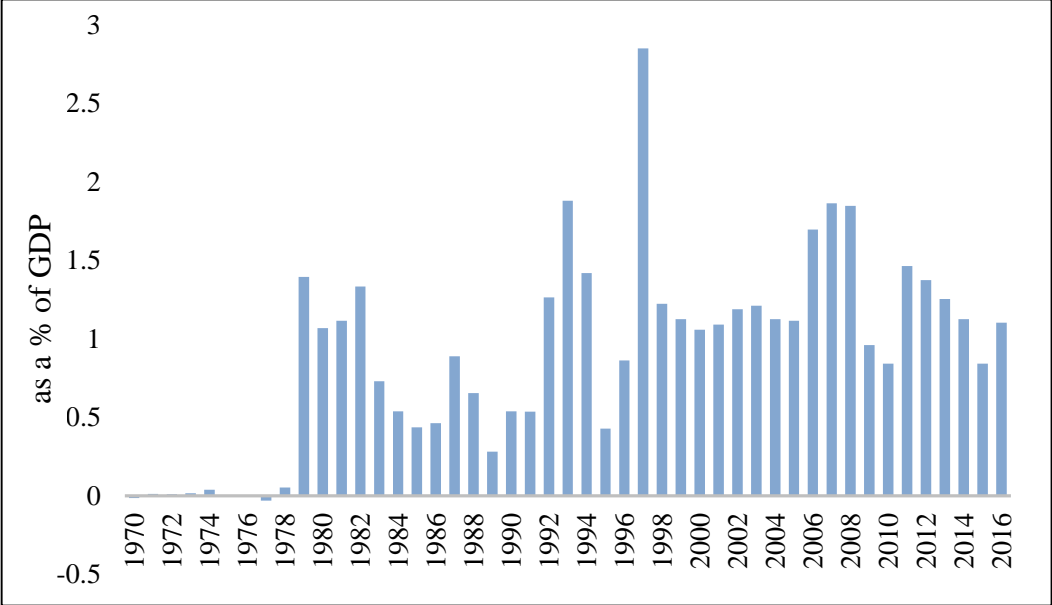
Country	2005	2010	2015	2016
Afghanistan	271	54	163	85
Bangladesh	760	1232	2831	2326
India	7269	27397	44009	44458
Pakistan	2201	2022	1621	2324
Sri Lanka	272	477	679	898
Nepal	2	87	52	105
Bhutan	6	75	10	8
Maldives	53	216	308	448

Source: World Development Indicators, 2017, World Bank

FDI inflows to Sri Lanka are not promising as indicated in Table 1. However, Sri Lanka is a significant case to address the growth-FDI relationship under the liberalized policies. As a result of “ZigZag” policies of the two main political parties that governed the country since its independence in 1948, FDI was not a significant part of capital accumulation until it opened up the economy in 1977. Influenced by the social democratic ideology, the government elected in 1956 considered central planning as an essential way to develop the country. Deterioration of terms of trade during the post-1956 period caused them to adopt import substitution (IS) policies (Athukorala, 1997). Consequently, various policies introduced by the government such as high tariffs, controls on import, controls on foreign exchange, price controls, and nationalizing policies damaged the investor confidence. The government elected in 1965 applied market oriented policies by liberalizing the economy. However, once again, state control was strengthened during 1970 and 1976 by the government elected for the period. They adopted IS policies rigorously. Finally, the government elected in 1977 introduced a comprehensive package of economic liberalization policies and the policy was honored by all the governments that were elected thereafter.

The impact of economic liberalization on FDI is clearly reflected in Figure 2, which exhibits the net FDI inflows into Sri Lanka as a percentage of GDP from 1970 to 2016.

Figure 2: Net FDI Inflows to Sri Lanka as a Percentage of GDP, 1970-2016

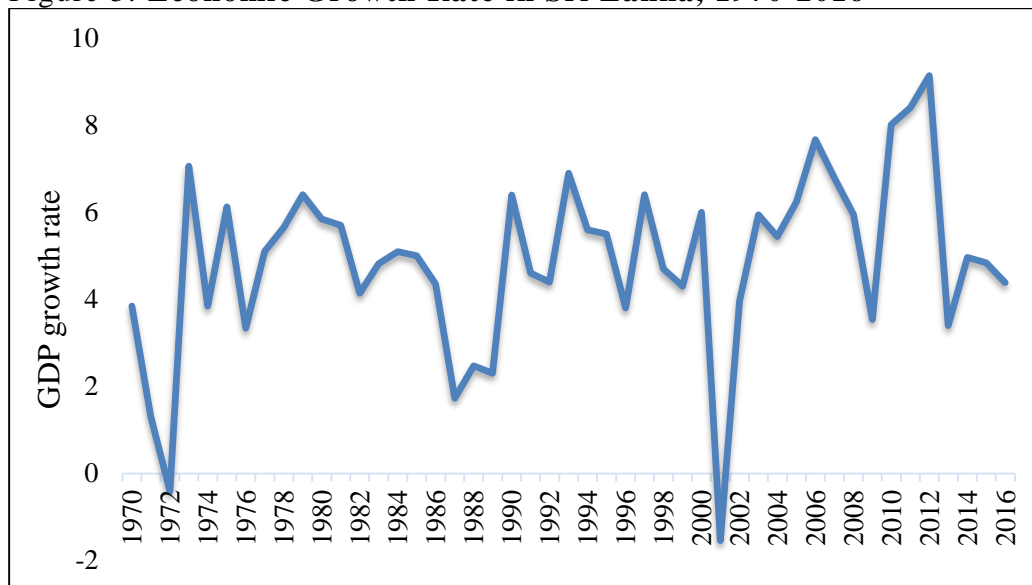


Source: Data Bank of Sri Lanka, 2017, World Bank

FDI expanded from 0.05% in 1978 to 1.39% in 1979 and achieved its peak of 2.8% in 1997. FDI inflows declined significantly in 1984 due to ethnic conflict and in 1989 due to youth uprising of the country. In 2002, Sri Lanka signed Indo-Lanka Free Trade Agreement and as a result, India became a major investor in Sri Lanka. In 2009 and 2010, FDI inflows were affected by global financial crisis. Sri Lanka could attract significant amounts of FDI inflows in the post-war period. However, since 2015 FDI inflows reduced substantially due to the uncertain economic and political environment created in the country and suspension of the Colombo Port City project.

Figure 3 shows the GDP growth rate of the country from 1970 to 2016. Sri Lanka recorded average growth rates of 4.14% in 1980s and 5.26% in 1990s. Average growth was 5% in 2000s and 5.1% between 2001 and 2016. Therefore, Sri Lanka has achieved stable growth rate over the last four decades.

Figure 3: **Economic Growth Rate in Sri Lanka, 1970-2016**



Source: *Data Bank of Sri Lanka, 2017, World Bank*

Since 1970 to present, FDI inflows have increased (see Figure 2). However, the growth performance of Sri Lanka was not satisfactory and had faced numerous fluctuations over time (see Figure 3). Therefore, an obvious relationship cannot be identified by observing the behavior of FDI inflows and growth. Therefore, we believe that Sri Lanka is a strong case study to address a research problem of this nature.

3. Literature Review

The theoretical background of the FDI-growth relationship can be better explained through either neo-classical or endogenous models (Hoang et al., 2010). Neo-classical growth models consider FDI as a source which accumulates the existing capital stock in the receiving country (De Mello, 1997; cited in Hoang et al., 2010). Bhagwati (1978) illustrated that FDI promotes growth under liberal market policies than protective market policies because the former stimulates the volume and efficiency of FDI.

Atique et al. (2004) conducted a study in Pakistan over the period from 1970 to 2001 and they constitute the Bhagwati hypothesis which states that impact of FDI on growth is superior under EP policies rather than IS policies. The reason is because the EP policies target a larger international market whereas the IS policies target a limited domestic market. Moreover, spillover effects occur as more employment opportunities are generated under EP policies due to the larger production capacity associated with a larger market.

The study of Kotrajaras et al. (2011) was conducted using panel data of 15 East Asian countries categorized according to their development levels. It employed co-integration method and concluded that FDI contributes positively to economic growth in high and middle income countries due to better economic conditions prevailing in those countries in terms of quality education, infrastructure development through high government expenditure, efficient financial systems and extent of trade openness. Further, FDI is more beneficial towards growth in high income countries compared to middle income countries since the latter experience corruption, poor educational level and insufficient government investment. Finally, FDI does not show a positive impact on growth in lower income countries due to deficient levels of above mentioned conditions along with high level of corruption.

Wijeweera et al. (2010) analyzed the FDI-growth relationship by employing a stochastic frontier model using data from 1997 to 2004 gathered from 45 countries. They argued for a positive impact from FDI on growth only when the host country possesses high skilled labour. In other words, a country cannot absorb the advanced technology which is transferred with FDI, unless there is a skilled labour force.

Using a panel data set for 69 countries over the period from 1970 to 1989, Borensztein et al. (1998) examined how FDI determines economic growth. They found out that FDI is a significant mean which transfers the technology and has a greater impact on growth than on domestic investment. However, they further suggested that the contribution of FDI exists when the receiving country is capable to absorb advanced technology which is ensured by the level human capital.

Fan and Dickie (2000), examined the role of FDI in determining growth in ASEA-5 countries. The results suggest a direct influence from FDI on growth being a major source of capital formation during the period from 1987 to 1997. Countries who have received more FDI have gained more towards the growth compared to other countries.

Ahmad and Hamdani (2003) studied the FDI-growth relationship using a panel data of 32 developing countries and 27 years from 1965 to 1992. The main finding was, although FDI contributes to the economic growth it was not important than domestic investment. Further, they suggested that contribution of domestic investment is more reliable and stable than FDI. Thus, if the adverse balance of payments resulting from the profit repatriation is taken into consideration, the positive impact of FDI on growth diminishes.

Adelegan (2000) argued that the impact of FDI on growth depends on uses of the FDI. In Nigeria FDI has negatively affected on growth due to the facts that FDI flow is directed to unproductive uses such as consumption, saving and importation of consumer goods and services. Some others argued that FDI is not a significant determinant of growth in developing countries (Naveed & Shabbir, 2006; Falki, 2009).

Empirical evidences on the growth-FDI relationship are mixed in the Sri Lankan context, as well. Based on a time series analysis, Athukorala (2003) argued that FDI does not affect economic growth in Sri Lanka. In contrast, Balamurali and

Bogahawatte (2004) identified FDI as a key determinant of growth in Sri Lanka after 1977. In addition, they found a bi-directional causality between FDI and growth, using Engle and Granger error-correction approach. Mustafa and Santhirasegaram (2013) also found a positive impact FDI on economic growth in Sri Lanka. Further, they emphasized that the impact of FDI on growth appears only after two-year lag time.

4. Methodology

In general, economists apply a production function in the following form in order to analyze the economic growth of an economy.

$$Y = f(K, L) \quad (1)$$

where, Y represents real output, K represents the total capital inputs, and L represents the labour inputs. In a liberalized economy, capital inputs can be decomposed as domestic capital and foreign capital. Foreign capital falls into four categories, namely, commercial loans, official flows, FDI, and foreign portfolio investment. From the stand point of developing countries, FDI is significant as it has become the largest, as well as the most stable external source of finance (UNCTAD, 2017). Neo-classical growth accounting framework identifies inflation as one of the key determinants of growth (Tiwari & Mutascu, 2011). In addition, inflation should be considered as a key explanatory variable of growth due to recent economic destructions in Zimbabwe in 2009 and in many South American countries in late 1990s. In addition to the fact whether the economy is liberalized or not, the extent of liberalization also plays a key role in determining the economic growth. Therefore, it is common to use economic openness in the growth equation to control the extent of economic liberalization. Popularized by Keynesian explanations, many developing countries have a large government sector that controls the main economic activities of the country. For instance, in Sri Lanka, government investments dominate the main economic sectors such as education, health, banking, insurance, electricity, water and aviation. Therefore, size of the government needs to be controlled.

Based on the above, we extended the Equation (1) as follows:

$$Y = f(DK, FDI, L, Inf, Open, GovtSize) \quad (2)$$

Where, *DK* denotes domestic capital, *FDI* denotes Foreign Direct Investments, *L* denotes labor force, *Inf* denotes inflation, *Open* denotes economic openness, and *GovtSize* denotes the size of the government.

We employed a linear ARDL model to estimate the Equation (2). ARDL model was employed by scholars to test the long run and short run effects between variables such as public debt and economic growth (Fernando et al., 2017), stock market prices and inflation (Akmal, 2007), inflation and openness (Afzal et al., 2013), macroeconomic variables and equity prices (Hasan & Nasir, 2008), and school education and economic growth (Afzal et al., 2010). Similarly, this paper uses a linear ARDL model to analyze the long run and short run effects of FDI on

growth. The ARDL specification⁶ helps to overcome endogeneity problem in growth-FDI nexus as the relationship is analyzed in a dynamic specification with lagged dependent and explanatory variables (Murthy & Okunade, 2016). Thus, the empirical model of Equation (2) is specified as follows:

$$\Delta \ln Y_t = \alpha + \sum_{j=1}^{n1} \beta_j \Delta \ln Y_{t-j} + \sum_{j=0}^{n2} \gamma_j \Delta \ln FDI_{t-j} + \sum_{j=0}^{n3} \delta_j \Delta X_t + \theta_1 \ln Y_{t-1} + \theta_2 \ln FDI_{t-1} + \theta_3 X_t + \varepsilon_t \quad (3)$$

where, $\ln Y_t$ represents the natural log values of real GDP in year t, $\ln Y_{t-j}$ denotes natural log value of real GDP in year t-j (j=1~8), $\ln FDI_{t-j}$ denotes natural log values of net FDI in year t-j (j=1~8).

Other exogenous variables are represented by X_t . Those variables comprise of domestic investment as a share of GDP⁷ (Balamurali & Bogahawatte, 2004; Athukorala, 2003); population growth (Afonso & Jalles, 2012; Checherita & Rother, 2012; Panizza & Presbitero, 2014); trade openness (Atique et al., 2004; Hoang et al., 2010; Afonso & Jalles, 2012; Panizza & Presbitero, 2014), inflation (Kotrajaras et al., 2011; Panizza & Presbitero, 2014; Afonso & Jalles, 2012), and government expenditure as a share of GDP to capture the size of the government (Angelopoulou & Liargovas, 2014).

Liberalization stimulates international trade in terms of both exports and imports (Zakaria, 2014; Santos-Paulino & Thirlwall, 2004). Therefore, the study incorporated trade openness as an explanatory variable which capture the effects of liberalization over the period of the study. Consequently, variations in the liberalization policies during different government regimes were addressed through LN_OP.

Short run parameters to be estimated were identified as β_j , γ_j and δ_j and long run parameters to be estimated are θ_1 , θ_2 and θ_3 . Error term of the model is denoted as ε_t .

In this study, we tested the validity of three hypotheses to redefine the relationship between growth and FDI in a liberalized economy.

Hypothesis 1: FDI does not have any effect on economic growth in the long run

Hypothesis 2: FDI does not have any effect on economic growth in the short run

Since, FDI transfers new technology into the recipient country, Borensztein et al. (1998) argued that FDI was more productive compared to domestic investment. Hence, in addition to the above general hypotheses, we tested the following hypothesis as well.

⁶ Advantages of ARDL over other cointegration methods, and ARDL procedures are discussed in Pesaran et al. (2001), Bal and Rath (2014), Murthy and Okunade (2016), and Fernando et al. (2017).

⁷ We estimated domestic investment by subtracting FDI from gross fixed capital formation.

Hypothesis 3: In a liberalized economy, FDI has a greater impact on economic growth than domestic investment

The study employed secondary data from 1978 to 2016 to estimate the empirical model stated in Equation (3). Real GDP, FDI, government expenditure, inflation, population growth and domestic capital were collected from World Bank data, whereas import and export data to calculate trade openness were collected from Central Bank of Sri Lanka.

Table 2: Summary Statistics and Results of Unit Root Test with Break Dates

Variable	Abbreviation	Summary Statistics					Unit Root Tests		Break Dates	
		N	Mean	SD	Min.	Max.	ADF test	Breakpoint Unit Root Test	Trend break	Break dummy
Log (Real GDP)	LN_GDP	39	24.12	0.55	23.21	25.1	I(1)***	I(1)**	2009**	2009**
Log (Real FDI)	LN_FDI	39	21.06	1.66	16.33	24.34	I(0)***	I(0)***	2011	2011
Log (Domestic Capital to GDP Ratio)	LN_DK_GDP	39	3.16	0.11	2.93	3.4	I(1)***	I(1)***	2000	2000***
Population Growth	POP_GROWTH	39	1.07	0.42	0.55	1.96	I(1)***	I(1)***	1998***	1998***
Log (Openness to GDP Ratio)	LN_OP	39	-0.56	0.21	-1.01	-0.25	I(1)***	I(1)***	1996***	1996
Inflation	INF	39	10.49	5.48	0.58	22.79	I(0)***	I(0)***	2006**	2006
Log (Government Expenditure to GDP Ratio)	LN_GOVEX_GDP	39	2.31	0.21	2	2.86	I(1)***	I(1)***	2009***	2009***

5. Findings and Analyses

The study occupied Augmented Dickey-Fuller (ADF) Test and Breakpoint Unit Root Test to verify the prerequisite to use ARDL specification, i.e., the variables incorporated in the model should be either at I(0) or I(1). Table 2 shows the abbreviations, summary statistics, unit root tests results and break dates for each variable. Accordingly, both tests validate that all the variables are stationary either at I(0) or I(1).

We relied on Breakpoint Unit Root Test to verify stationary of data series as the traditional unit root test are not suitable for the purpose when there are structural breaks in the series (Perron, 1989). Several break dates that are presented in Table 2 were identified endogenously by employing Breakpoint Unit Root Test. The year 2009 emerged as a common break year for both variables of LN_GDP and LN_GOVEX_GDP. The year made the end of 30 year civil war in Sri Lanka making structural changes in many macroeconomic variables. At the same time, 1998 was identified as another break which is significant in POP_GROWTH variable. After a continuous decrease in population growth since 1982, it turns to increase from 1998 onwards. Therefore, we controlled for these two structural breaks when estimating the Equation (3).

Table 3: Long Run ARDL Cointegration Model

Selected model	ARDL(1, 7) ^a
Included observations	32
Bound Test F Statistics for small samples ^b (k=1)	21.94***
Endogenous Regressors	
LN_FDI	0.015***
Exogenous Regressors	
LN_DK_GDP	0.229***
LN_OP	-0.006
POP_GROWTH	-0.003
INF	0.001**
LN_GOVEX_GDP	0.098***
BREAK2009	0.103***
BREAK1998	0.003
@TREND	0.031***

Notes: (a) We estimated this model with trend and intercept using eight lags of the dependent variable and FDI. After evaluating 72 models, one lag of GDP and seven lags of FDI (1,7) were selected as the best model based on Schwarz Selection Criteria.

(b) bound test statistic for small samples (Narayan, 2005)

(c) ***, **, and * denotes significance at the 1%, 5% and 10%, respectively.

Table 3 and Table 4 present the long run and short run co-integration estimates of Equation (3), respectively. Negative and highly significant coefficient of error-correction term in Table 4 indicates a long run relationship between growth and selected dependent variables in Equation (3). As presented in Table 3, LN_FDI, LN_DK_GDP, INF, and LN_GOVEX_GDP are identified as key determinants of long run economic growth in Sri Lanka. Positive and highly significant coefficient of LN_FDI shows that FDI is a significant determinant of the long run economic growth in Sri Lanka under liberalized market conditions. Therefore, we have strong evidences to reject the first hypothesis of the study. The positive impact of FDI on economic growth is not a surprise. However, the magnitude of the impact of FDI on growth is not convincing.

In contrast, domestic investment has become the most influential determinant of the long run growth in Sri Lanka. This is indicated by the positive and highly significant coefficient of domestic investment in the model. Positive and highly significant coefficient of structural break dummy for 2009 suggests that post-war growth has been significantly greater than the rest of the years. In Sri Lanka, government expenditure has been a dominant factor of long run economic growth despite economic liberalizations. This is indicated by the positive and highly significant coefficient of LN_GOVEX_GDP. Inflation also exercise a significant positive impact, but to a very little extent.

Trade openness, population growth, and structural break in 1998 do not show any significant contribution towards the long run growth. Insignificant coefficient of LN_OP demonstrates that the extent of trade openness has not facilitated economic growth in Sri Lanka. Similar to long-run analysis, domestic capital, FDI, structural break in 2009, government expenditure and inflation are identified as the significant determinants of the short-run growth in Sri Lanka (see Table 4). Highly significant and positive coefficients of FDI and its lagged variables suggest that FDI has a positive impact on growth in the short run. Therefore, we have strong evidences to reject the second hypothesis of the study, as well.

In third hypothesis, we compare the contribution of FDI and domestic capital towards economic growth. Results suggest that the impact of FDI on Sri Lanka's growth is far below compared to that of domestic investment in long run and short run, which is contrary to the arguments of Borensztein et al. (1998). Our findings support the results of Kotrajaras et al. (2011). They argue that high income countries gain more benefits from FDI than others as a result of accrued human capital, high trade openness, efficient financial markets, good governance in those countries. Moreover, Wijeweera et al. (2010) highlight the importance of human capital in the process of materializing benefits from FDI. The bottom line is, liberalization helps to attract FDI and consequently stimulate economic growth. However, the magnitude of the impact is constrained by other developments in the economy.

Table 4: ARDL Cointegrating Long Run Error-correction Models

Selected model based on Schwarz Criterion (SC)	ARDL(1, 7) ^a
Included observations	32
Bound Test F Statistics for small samples ^b (k=1)	21.94***
Endogenous Regressors	
D(LN_FDI)	0.015***
D(LN_FDI(-1))	0.001
D(LN_FDI(-2))	-0.004
D(LN_FDI(-3))	-0.003
D(LN_FDI(-4))	0.0008
D(LN_FDI(-5))	0.007**
D(LN_FDI(-6))	0.006***
Exogenous Regressors	
LN_DK_GDP	0.229***
LN_OP	-0.006
POP_GROWTH	-0.003
INF	0.001***
LN_GOVEX_GDP	0.098***
D_2 (BREAK1998)	0.003

D_1 (BREAK2009)	0.103***
C	16.66***
CointEq(-1)	-0.776***

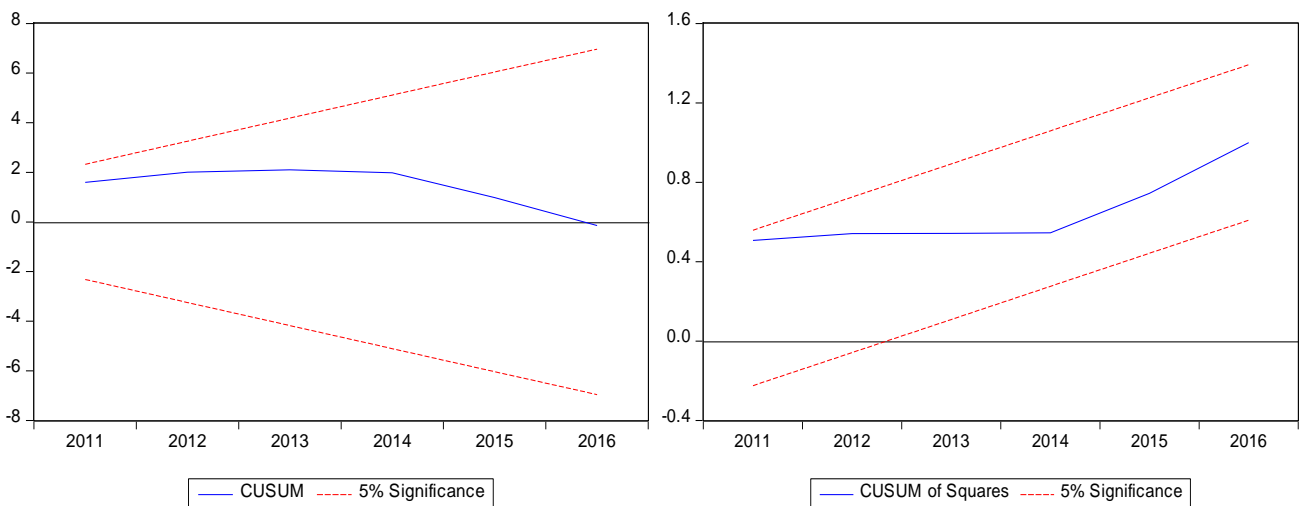
Notes: (a) We estimated this model with trend and intercept using eight lags of the dependent variable and FDI. After evaluating 72 models, one lag of GDP and seven lags of FDI (1,7) were selected as the best model based on Schwarz Selection Criteria.

(b) bound test statistic for small samples (Narayan, 2005)

(c) ***, **, and * denotes significance at the 1%, 5% and 10%, respectively

ARDL estimates are not reliable if stability of the parameter cannot be established (Bal & Rath, 2014; Murthy & Okunade, 2016). Therefore, in this study, we employed Cumulative Square (CUSUM) and Cumulative Sum of Square (CUSUM of Square) to assess the parameter stability of the model. Stability is warranted if the recursive residuals are within the critical boundaries of the graphs. As exhibited in Figure 4, both CUSUM and CUSUM of Square of the recursive residuals behave within the critical boundaries set at 5% significant level. Therefore, we can validate the stability of the estimated ARDL (1, 7) model.

Figure 4: Stability Tests of Recursive Residual



Since the ARDL is the OLS estimation, it is important to test the basic properties of the estimates. Therefore, we ran several diagnostic tests to assure validity of the model. First, we tested the normality of the error term using Jarque-Bera normality test. Accordingly, the estimated test statistic of the model was 0.627 (p value 0.730). Therefore, we failed to reject the null hypothesis, i.e., the error terms were normally distributed, at 1% significant level.

Second, we applied Breusch-Godfrey serial correlation LM test to verify whether there is an autocorrelation or series correlation problem in the estimated model. We failed to reject the null hypothesis of the Breusch-Godfrey serial correlation LM test, i.e. there is no serial correlation, as the test statistic is 5.033 (p value 0.177).

Third, Breusch-Pagan-Godfrey heteroscedasticity test was employed to test whether the model is free from heteroscedasticity problem. Highly insignificant test statistic of 0.868 (p value 0.613) provides enough evidence to conclude that the model is free from heteroscedasticity problem. Ultimately, the tests results indicated that the estimated model is free from any violation of OLS assumptions.

6. Conclusions

In this study, we analyzed the long run and short run impact of FDI on economic growth in Sri Lanka under the liberalization policies of the country. In addition, we compared the impact of domestic capital and FDI on economic growth by employing a linear ARDL model and data from 1978 to 2016. The main determinants of long-run and short-run economic growth in Sri Lanka were FDI, domestic capital, inflation rate and size of the government. Thus, we can conclude that FDI significantly contributes long-run and short-run economic growth in liberalized economies as suggested by Bhagwati (1978). However, the magnitude of the impact of FDI on growth remains very low. Domestic investment has the highest significant impact on growth. Therefore, we redefined the growth-FDI nexus as follows. Liberal market policies are the necessary condition to enhance the FDI-growth relationship. However, it is not a sufficient condition to stimulate economic growth as the positive impact of FDI on growth is shaded by other socio-economic factors.

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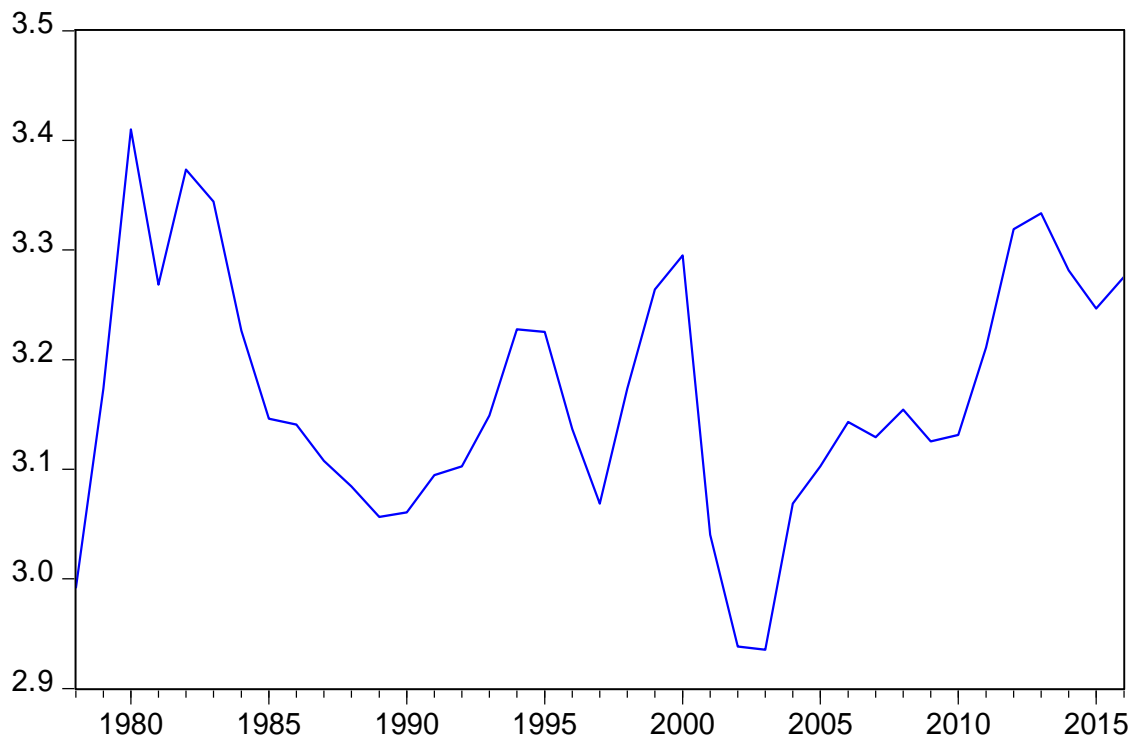
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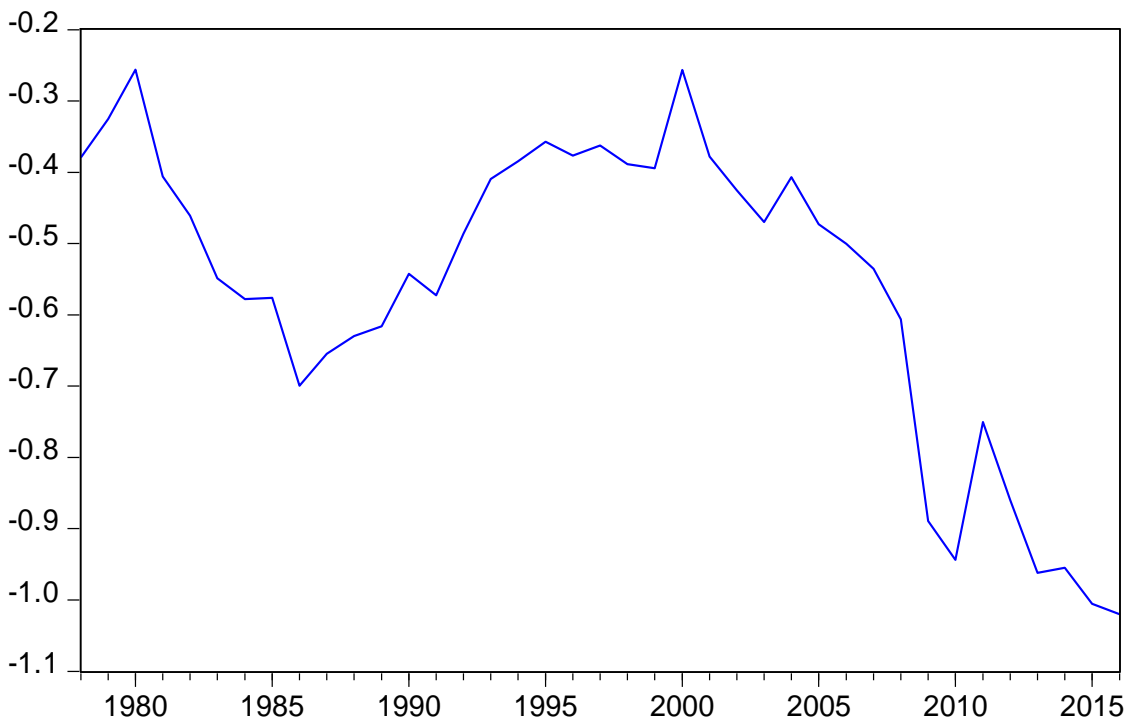
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Annexure: **Behaviour of Variables**

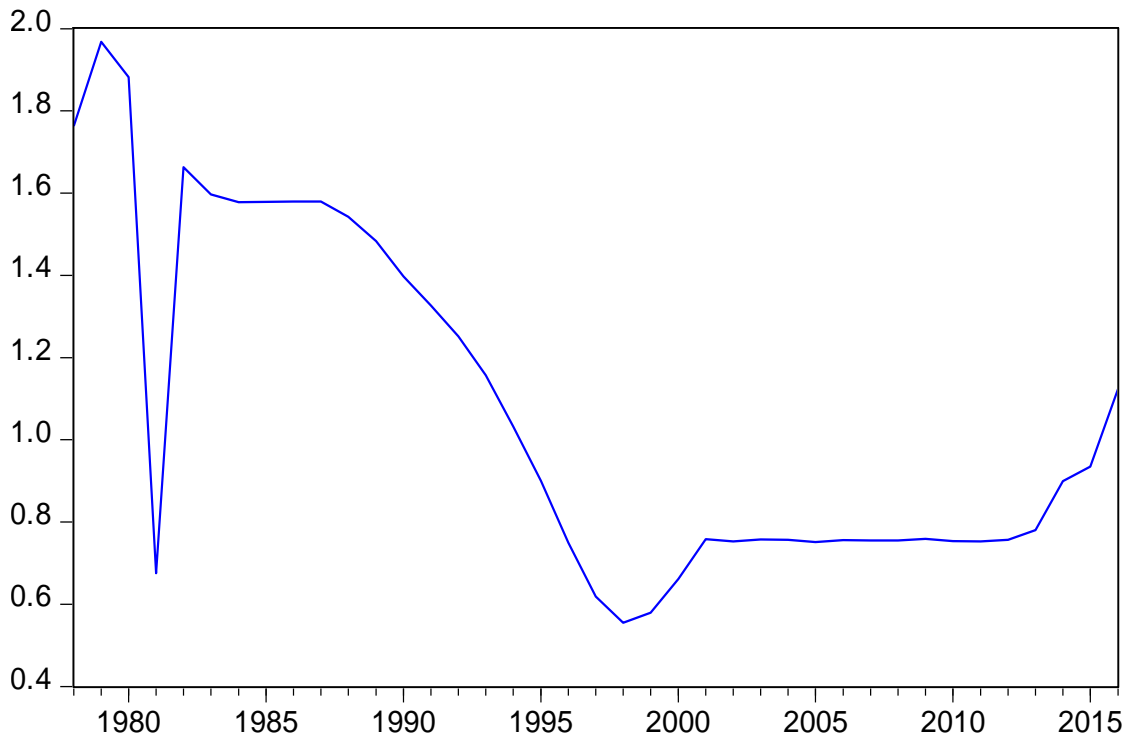
LN_DK_GDP



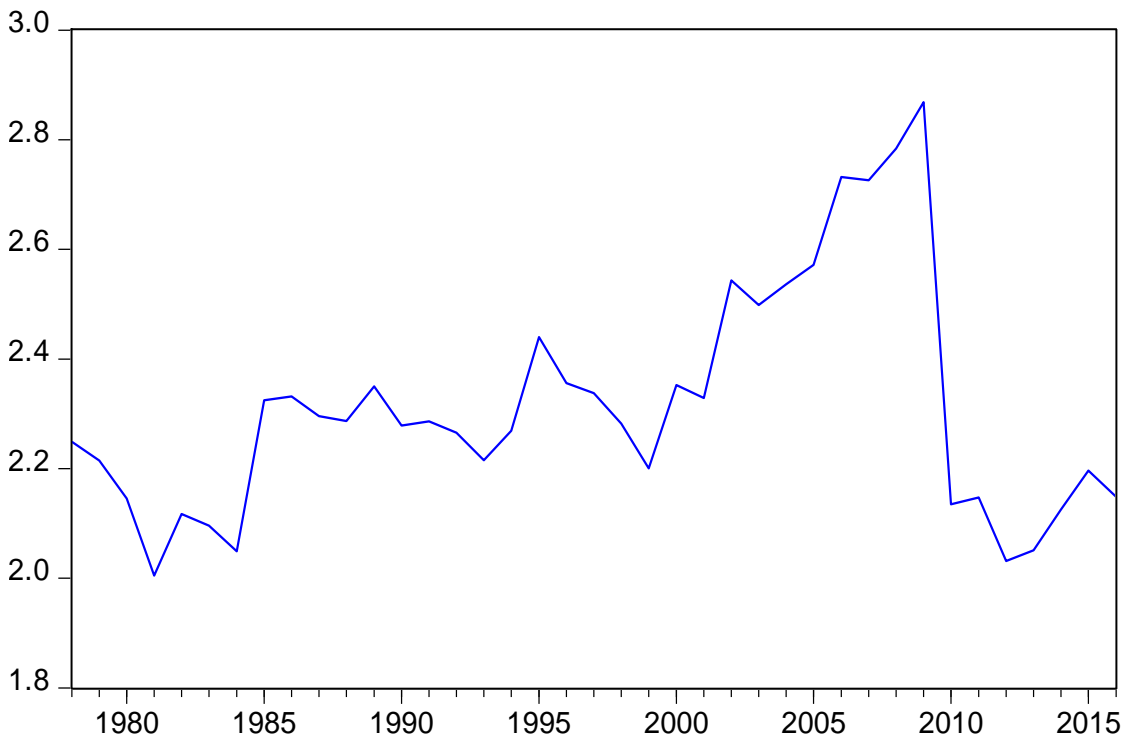
LN_OP



POP_GROWTH



LN_GOVEX_GDP



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