

THE RELATIONSHIP BETWEEN PRIVATE INVESTMENT AND GOVERNMENT INVESTMENT AFTER ECONOMIC LIBERALIZATION

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Abstract

Investment is an important element of the development of the economy in which the private investment is considered as the key engine of economic growth of developed and developing countries. Empirical studies reveals that the private investment has been influenced by number of economic variables. Sri Lanka had introduced liberalized economic policies in 1977 and the policy changes have made wide impact on the economy including the private investment. The main objective of this study is focused on the empirical relationship private investment and government investment after the economic liberalization 1977. This study used secondary data which are time series data collected from various sources of Central Bank Annual Reports and magazines. The analysis was carried out for the period from 1977 to 2016. Multiple Regression Analysis was used to estimate the impact. Estimation method was Ordinary Least Squares (OLS). EViews 9 econometrics software were used for data analysis. The empirical evidence shows that there is a statistically significant positive impact of selected economic variables on the private investment.

Keywords: Private Investment, Government Investment, Foreign Direct Investment

1. Introduction

Investment is considered as one of the important economic force through which developing countries can carry out economic growth consequently. In developing countries, investment helps to tackle socio-economic problems such as unemployment, lack of capacity, scarcity of foreign exchange, and poor technological ability, etc. (Mustafa, 2013). After the liberalized policies introduced with relaxation of exchange controls and tariffs, foreign direct investment brought in to the country increased from 0.1 percent to 5 percent from 1978 – 1989 (Prema-Chandra 2004) and private sector played a pivotal role ((Athukorala and Rajapathirana, 2000). And also, it is an opportunity that can be used to increase the rate of return from the investment. Thus, the capital available at cheaper rate of interest and the domestic consumption which is higher in the host country due to the lower price levels leads to attract Foreign Direct Investment to stimulate economic growth and development (Mustafa,2019). Through the foreign investments, new technology infusion, capital formation, favorable balance of payment, infrastructure development, tourism sector development and resource utilization were resulted. After 1977, Sri Lanka has adopted number of attractive policy changes to induce investment in the private sector ((Athukorala and Rajapathirana, 2000). As per the various annual reports of Central Bank of Sri Lanka, the Private Investment has been increased from Rs. 4,875 Mn in 1977, Rs. 58,790 in 1990, Rs. 311,460 in 2000 to Rs. 2,808,535 Mn in 2016. The government investment has also increased from Rs. 367 Mn in 1977, Rs. 12,655 Mn in 1990, Rs. 41,112 Mn in 2000 to Rs. 915,340 in 2016. Therefore, this is obvious that both the private and government investments

have been increased during the research period. The main objective of the research is to find out the empirical relationship between the private investment and government investment in Sri Lanka after the economic liberalization in 1977.

2. Literature Review

Many studies have investigated the relationship between Private Investment (PI) and Government Investment (GI). An increase in public investment is expected to increase private investment as it allows firms to have a broader access to markets due to construction of roads, ports, railways, and so on. Cavallo and Daude (2011) found that an increase in public investment is also expected to increase private investment by increasing the marginal productivity of capital. Blejer and Khan (1984) conducted a research on government policy and private investments in 24 developing countries during the period from 1971-1979 and they found that the investment made on public infrastructure is complementary to private investment and there was a crowding in effect of public investment on private investment. The marginal productivity of capital in the private sector was crowded in United States through the increase of public capital (Aschauer 1989). Erden and Holcombe (2005) carried out a research on the effect of public investment on private investment in 19 developing countries during the period of 1980-1997 and found that there was a positive correlation between private and public investment.

Khan. Sajawal (2007), Ouattara. Patrick (2006) and Tantiasti. Dwi (2008) have concluded that the presence of public investment has a crowding-in effect on private investment in which the public sector investment has positive effect on private investment via irrigation, transportation, communication, health, and education. Nazmi and Ramirez (1997) analyzed the impact on economic growth of public and private investment spending. They concluded that public investment expenditures had a positive and significant effect on output growth. Rahaman (2005) found that private and public investments do appear to have different effect on the long-economic growth of Bangladesh. In other words, the marginal productivity of private and public investment is differing in Bangladesh. Further, private investment plays a much larger and thus more important role in the growth process of Bangladesh. Kodithuwakku et.al (2016) studied about the factors affecting the private investment in Sri Lanka by using multiple regression model based on the secondary data covering from the period of 1975 to 2015. The study has revealed that real GDP growth, real exchange rate, inflation rate, budget deficit, foreign trade, foreign direct investment and liberalization factor were positively influenced the private investment.

Kandenge (2006) conducted a study on Public and Private Investment and Economic Growth in Namibia covering the secondary data from 1970 – 2005 with the aim of studying the impact of Public and Private Investment on Economic growth of Namibia. For this purpose, the co-integration and error correction models were adopted. Study revealed that exports, imports, economic freedom, labour and human capital were significantly and positively contributed on short and long term economic growth in addition to the public and private investment. The present study is therefore an endeavor to examine the relationship between Private and government investment by using time series data. At the same time, there are empirical evidences where the government investment crowds out the private investment by decreasing the availability of savings to the private sector and leads to the increase of cost of funds thus resulting in higher borrowing costs. Dash (2016) conducted a research on the impact of public investment on private investment in India covering the period of 1970-2013 by using ARDL and found that one percentage increase in public investment as a ratio to GDP leads to 0.81 percent and 0.53 percent decrease in private investment in the long and short run respectively. Further, Dash found that the crowding out was dampen during post liberalization period. Everhart and Sumlinski (2001) found a negative correlation between public and private investment in 63 developing countries between 1970 and

2000. At this backdrop, this research is investigating the relationship between private investment and government investment in Sri Lanka econometrically and descriptively based on the variables identified in the above reviewed literatures.

3. Methodology

This study uses annual data for the period from 1977 to 2016. Data for this study have been collected from the Economic and Social Statistics and Annual Statistical Report, in Sri Lanka. Variables of the study are Private Investment (PI), Government Investment (GI), Foreign Direct Investment (FDI), Exchange Rate (EX), Interest Rate (IR) and Inflation (INF). All the above indicated variables are falling into the data type of quantitative variables that are measured by multiple regression analyses. Econometric Methodology - Multiple Regression and Spearman Rank Order Correlation analysis have been used to analyze the data and Ordinary Least Square (OLS) is used to estimate the parameters of the model. E-views9 Econometrics software was used for the data analysis. Time series variables are to be converted into natural logarithms before the analysis in order to interpret the elasticity. Unit root analysis is employed in order to avoid specious model due to trending variables since the use of non-stationary variables in time series analysis leads to misleading inferences. Therefore, ADF (Augmented Dickey Fuller) test is to be utilized to establish the order of integration of the variables employed in the study. Model selection was performed by checking test statistics value, probability value, Durbin - Watson 'd', and adjusted R2 under market price and real price. Based on the model selection criteria, the following log transformation is selected to test the data on private investment and government investment

$$\ln PI_t = \hat{\beta}_0 + \hat{\beta}_1 \ln GI_t + \hat{\beta}_2 \ln FDI_t + \hat{\beta}_3 \ln EX + \hat{\beta}_4 \ln IR + \hat{\beta}_5 \ln INF + AR(1) + \mu_t$$

Where PI is Private Investment, GI is Government Investment, FDI is Foreign Direct Investment, EX is Exchange Rate, IR is Interest Rate and INF Inflation. $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4$ and β_5 are parameters.

Result of unit root analysis

Table 1: ADF test for Unit Root Analysis

Variables	ADF Test	Intercept t-value (p-value)	Trend & Intercept t-value (p-value)	None t-value (p-value)	Order of Integration
lnPI	1st Difference	-5.20 (0.0002)	-4.93 (0.0015)	-3.14 (0.0025)	I (1)*
lnGI	1st Difference	-6.80 (0.0000)	-6.78 (0.0000)	-2.78 (0.0066)	I (1)*
lnFDI	1st Difference	-5.81 (0.0000)	-5.69 (0.0002)	-6.36 (0.0000)	I (1)*
lnEX	1st Difference	-13.2 (0.0000)	-14.07 (0.000)	-7.79 (0.0000)	I (1)*
lnIR	1st Difference	-7.39 (0.0000)	-7.46 (0.0000)	-7.42 (0.0000)	I (1)*
lnINF	1st Difference	-9.78 (0.0000)	-9.67 (0.0000)	-9.93 (0.0000)	I (1)*

*Significance at 1%

Source: Authors computation by Eview 9

Table 2 : Engle-Granger Co-integration output

Null Hypothesis: RESID01 has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.693945	0.0000
Test critical values:		
1% level	-3.615588	
5% level	-2.941145	
10% level	-2.609066	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(RESID01)
 Method: Least Squares
 Sample (adjusted): 1979 2016
 Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID01(-1)	-0.953005	0.167372	-5.693945	0.0000
C	0.002174	0.023731	0.091593	0.9275
R-squared	0.473846	Mean dependent var		0.005129
Adjusted R-squared	0.459230	S.D. dependent var		0.198882
S.E. of regression	0.146252	Akaike info criterion		-0.955777
Sum squared resid	0.770026	Schwarz criterion		-0.869588
Log likelihood	20.15976	Hannan-Quinn criter.		-0.925112
F-statistic	32.42101	Durbin-Watson stat		1.988652
Prob(F-statistic)	0.000002			

The above table shows the result of performed Augmented Dickey Fuller (ADF) for the variables incorporated in this study. The ADF test results confirm that the time series data of the variables are stationary in their first difference. Therefore, the variables are integrated of order one, I (1). Since all the variables are stationary at I (1), co-integration test is performed and the output of the co-integration regression is presented in the table 2. According to the above Engle-Granger Co-integration analysis unit root test for residual co-integration equation was performed by ADF test. ADF test statistics and p-value are 5.69, 0.0000 respectively. As it is estimated, residual is stationary, variables LPI, LGI, LFDI, LEX, LIR and LINF are co-integrated.

Figure 1 and 2 are the plot of the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) from baseline specification against the critical bound of the 5 per cent level of significance show that the model specification is acceptable.

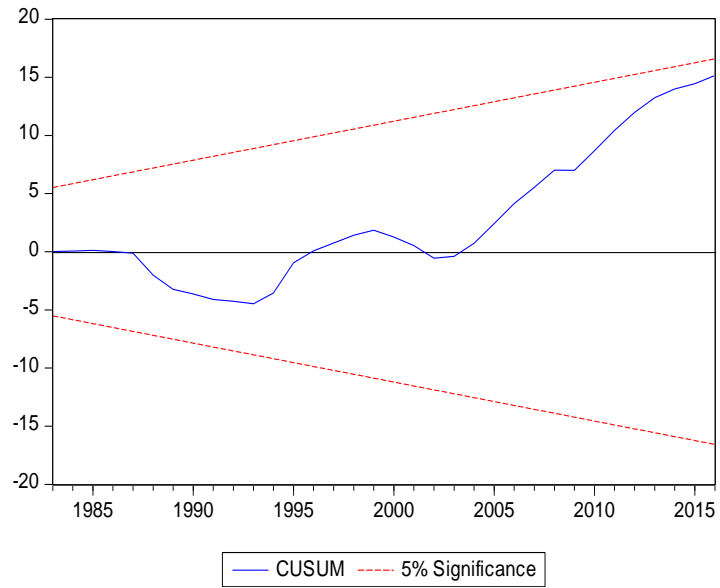


Figure 1: CUSUM test

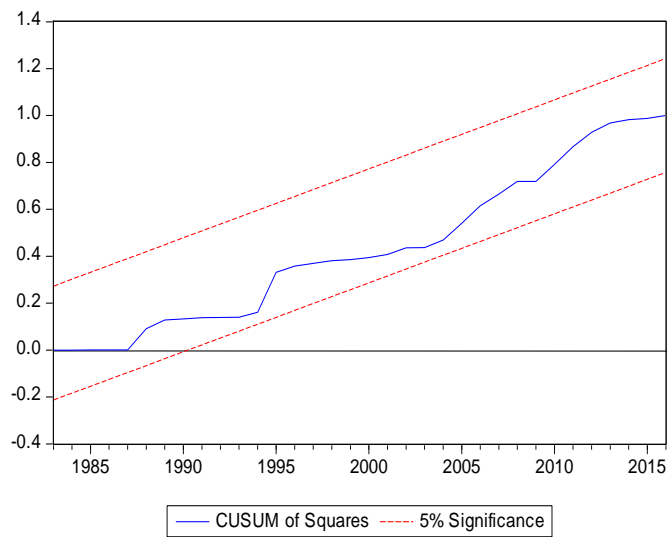


Figure 2: Cumulative Sum of Squares (CUSUMSQ)

4. Result and Discussion

The following figure 3 is the performed non-parametric test for the research variables during the research period (1977-2016).

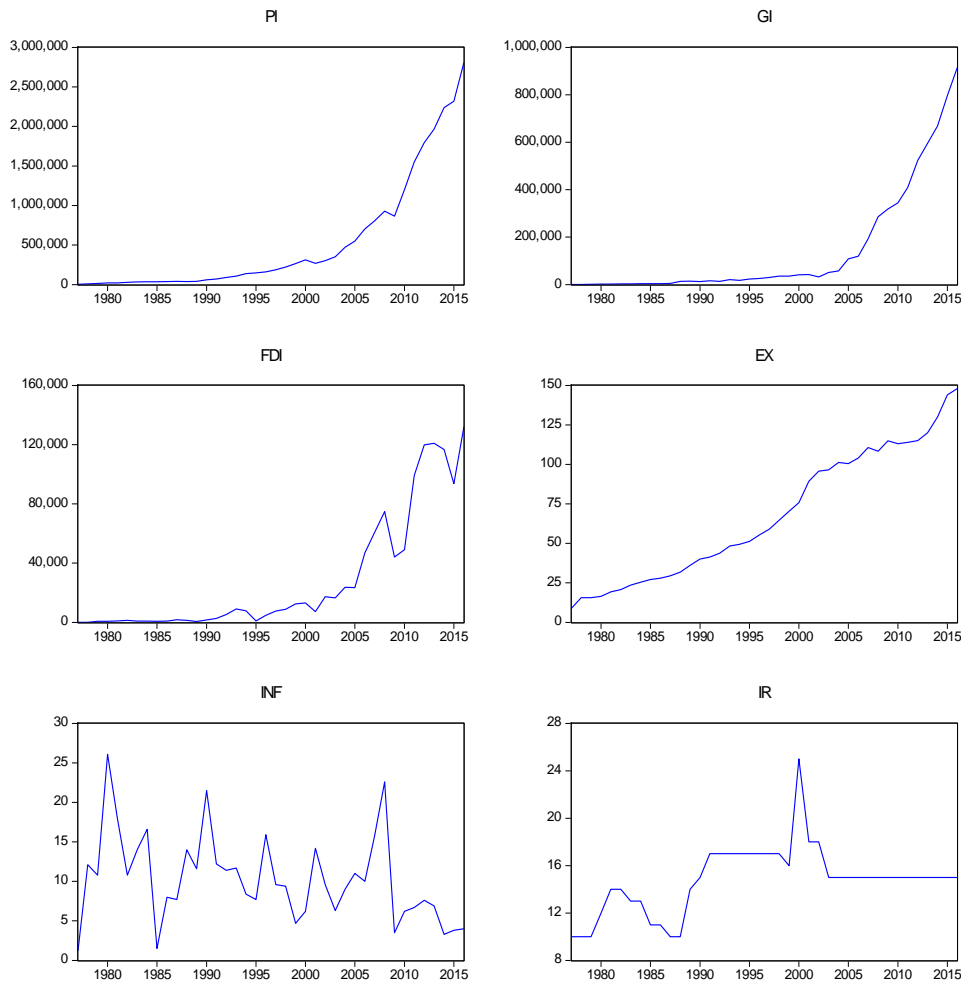


Figure 3: Non-parametric test for the model variables

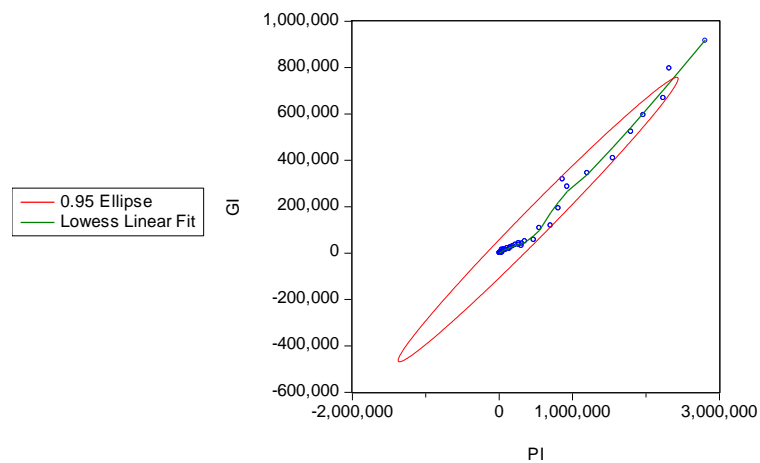


Figure 4 : Confidence ellipse with Nearest Neighbor fit between Private investment and Government Investment for the research period.

The above figure graphical presentation of data is very useful to identify the trend and underlying relationship between the variables Private investment and Government investment. The confidence ellipse with Nearest Neighbor fit show that there is positive relationship between Private and Government investments and both are highly correlated.

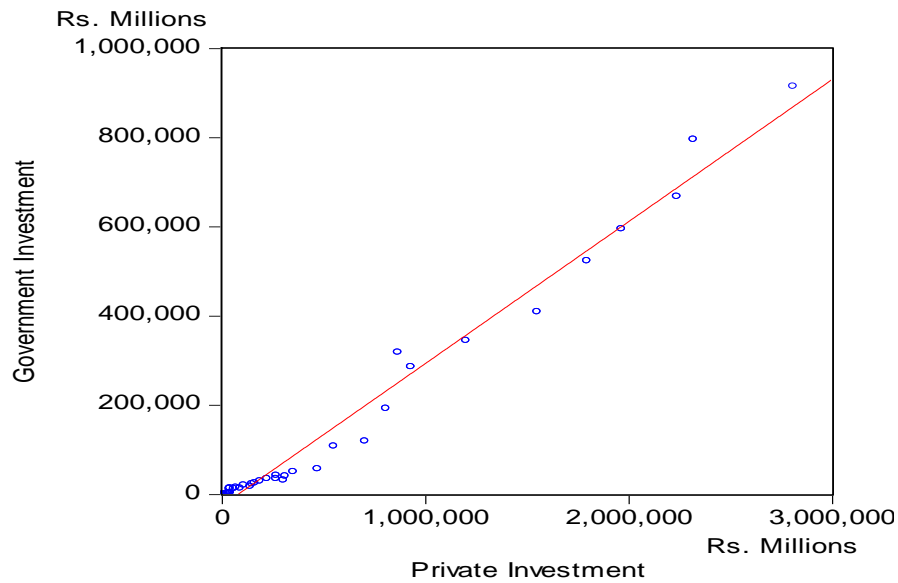


Figure 5: Correlation between Private Investment and Government Investment

Correlation between private investment and government investment is 0.99017 (Probability = 0.0000). This is aligned with the empirical results (Ramirez, 1998; Khan and Reinhart, 1990; Lutfi and Holcombe, 2005) and thus confirms the literature.

$$PI_t = 2.6637 + 0.311GI_t + 0.114FDI_t + 1.0521EX + 0.2795IR - 0.0202INF + \mu_t$$

Table 3: Regression Results of Private Investment and Government Investment(Log-Log Model)

Variable	Coefficient	t Value	Probability (p)
Intercept	2.6637	6.0532	0.0038
Government Investment(GI)	0.3110	3.8555	0.0005
Foreign Direct Investment(FDI)	0.1440	3.9104	0.0005
Exchange Rate(EX)	1.0521	4.2348	0.0002
Interest Rate (IR)	0.2795	1.1755	0.2485
Inflation (INF)	-0.0202	-0.5256	0.6028
R-Sq(adj) = 99.09%, F Statistic 696.90, Prob (F-statistic) 0.00000*			

*Significant at 1%

**Significant at 5%

A result of this study, there is a positive relationship between government investment and private investment (Indra 2014; Lutfi 2005). The impact of government investment on private investment is strategically significant at 1%. The estimated coefficient of Government Investment indicates that, 1% increase in Government Investment will increase Private Investment by 0.311%. This means that during the period of the study for the case of Sri Lanka, there is a crowding in effect of government investment on private investment. Further, the

Spearman Rank Order correlation indicates that there is 99% of correlation between private investment and government investment in Sri Lanka during the research period. The existence of the government's public sector investment expenditure for irrigation, transportation, communication, health and education has a positive impact on private investment. Bigger the government investment makes available facilities and infrastructure needed by the private sector to undertake productive activities.

In addition to the Government Investment, FDI and EX have positive relationship with Private Investment in Sri Lanka during the research period. Due to the FDI, private sector investments increased and foreign investors started to invest in various business ventures and projects in Sri Lanka after the liberalization. The impact of FDI on Private Investment is strategically significant at 1%.

For exchange rate variable, finding of the study indicates that the direction of the exchange rate has a positive impact on private investment. It implies that an increase in the exchange rate may lead to an increase in private investment and vice versa (Jongwanich and Kohpaiboon 2006; Patrick 2006). The estimated coefficient of exchange indicates that, 1% increase in exchange will increase Private Investment by 1.0521%. Exchange rate also strategically significant at 1% on the private investment. Although the interest rate is not strategically significant on private investment but it positively contributes to private investment.

Based on the results, the rate of inflation has a negative effect on private investment (Indra, 2014). High inflation has negative impact on the private investment expansion (Patrick 2006; Ribeiro and Teixeira 2001). The estimated coefficient of inflation indicates that 1% increase in inflation will decrease the private investment by 0.0202% and it is not statically significant to determine the private investment in the long run.

5. Conclusion

The existing literature on the impact of government investment on private investment have inconsistent conclusion. Some experts say that government investment has positive impact on private investment (Indra 2014; Ramirez 1994; Oshikoya 1994; Lufti and Randall 2005) and some economists have found out the negative impact of government investment on private investment (Wai and Wong 1982; Nazmi and Ramirez 1997). In the case of Sri Lanka, study reveals, there is a positive crowding in effect of government investment on private investment. Rate of inflation has negative impact on private investment in Sri Lanka during research period (Seruvatu at.el 2001; Acosta and Roza 2005; Patrick 2006). The exchange rate variable has positive influence on the private investment in Sri Lanka (Jongwanich 2006; Patrick 2006). Interest rate is positive but not strategically significant impact on private investment (Mehrara and Karsalari ; 2011) and the policy makers has to keep the interest low to promote private investment. Inflation has negative relationship with private investment (Abbas 2004; Roache 2006). Therefore, the government has to keep fair inflation rate. Stability of price levels must be kept to maintain the inflation at an acceptable level to promote private investment behavior in Sri Lanka.

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