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Does Public Sector Crowd out the Private Investment in Post War Sri Lanka?

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ABSTRACT:Given the government end the civil war in 2009, it was expected that Sri Lanka has a significant potential to have an economic boost with the favorable condition for private investment. But, after a decade of civil war, it is realized the fact that expectations were overestimated and the country suffers from similar types of economic drawbacks but in different aspects. Even though the government took several measures to stimulate the private sector, it seems that it has not been effectively implemented. Thus, this paper mainly focuses on investigating two questions. Firstly, whether the private investment has an impact on the economic growth of Sri Lanka during the post-war period (2010 – 2019). Secondly, whether the public sector; specifically public debt and public expenditure, has a negative impact on the country's private investments during the considered period. Autoregressive Distributed Lag (ARDL) approach was employed for the time series analysis. The main finding of this study is, while private investment contributes to economic growth in Sri Lanka, foreign debt and domestic debt tends to crowd-out private investment.

Keywords*:Autoregressive Distributed Lag model, Domestic Debt, Economic Growth, Foreign Debt, Private Investment, Public Investment*

I. INTRODUCTION

Economic theory does not make a clear distinction between the private and public components of investment regarding the impact on economic performance. Hence, theoretically, it is impossible to determine whether the private investment will necessarily stimulate economic performance at the cost of public investment [1]. However, a number of studies have provided mixed empirical evidence to support both ends. According to [2] these empirical studies provide answers to two different but related questions. Firstly, whether the public investment invigorates or slows down the private investment growth and secondly whether a resource unit allocated to public investment boosts economic growth more than a coequal amount allocated to private investment.

Related to this background, crowding-out/in of public investment on private investment have been a central point of theoretical and empirical debates in Economics for a long period of time. Different schools of thought have brought up several explanations based on different rationales and have been empirically investigated later on. Specifically, the crowding-out effect demonstrates the reduction of private investment against the expansion of the public sector. Also, as [3] stressed the burden of reduction due to public sector expansion can be fallen on either aggregate expenditure (real crowding-out) or interest rates (financial crowding-out).

Sri Lanka is not an exception for this situation which is normally considered as a country with a relatively larger public sector. Once the civil war ended in 2009, it was expected that Sri Lanka regains its capability towards the development without further obstacles. Ten years later, it is realized that the promised development is still far away from the country and it is suffering from several types of structural issues that limit the country's economic performance. Many researchers and studies have raised the concern of the larger public sector of Sri Lanka not only as a direct real burden to the economic performance but also indirect negative influencer which restricts the private sector's performance [4]. Given the facts, the main objective of this paper is twofold. Firstly, to investigate the relative roles of public and private investment in economic growth in the post-war period (2010 – 2019) of Sri Lanka. Secondly, to identify the fact that whether the public expenditure and public debt crowd out/in the private investment of the country by considering the same time span. The paper empirically examines the long-run impact of these two components using the Auto Regressive Distributed Lag (ARDL) bounds testing approach.

II. INVESTMENT AND PUBLIC EXPENDITURE DYNAMICS IN SRI LANKA: A SHORT OVERVIEW

In the time of independence, Sri Lanka was considered as one of the most prosperous and developed Asian countries which had a higher potential to reach development success in the third world [5]. Unfortunately, this early promised economic prosperity was not sustained much longer and the country had to go through several socio-economic and political changes. Specifically, thirty years of civil war between the Sri Lankan government and the Liberation Tigers of Tamil Eelam (LTTE) created an enormous disturbance to the economy of Sri Lanka by several aspects [6]. [7] estimated the economic cost of civil war from 1984 to 1996 as twice as the GDP of Sri Lanka in 1996. However, the government ended the war in 2009 and presented it as the beginning of a new era of economic development [8].

The early expectation of this post-war environment would create better conditions for economic expansion. Re-incorporation of Northern and Eastern provinces to national economic output stimulates the expansion and the country reached 8 percent of economic growth in the first two years soon after the war ended [9]. The average economic growth in the first half of the decade was reported as 6.7 percent [9]. The government's objective according to the development agenda *(MahindaChinthana: Vision for Future)* for the next decade was to make the country a middle-income nation by increasing the per capita income above the USD 4000 while keeping a continuous growth rate of 8% per annum [10]. The government specifically focused on sustainable high investment, shifting the structure of the economy, ensuring inclusive growth; improving the living standards and social inclusion as priority areas to reach the development goals [11]. However, the economic performance of the country in the latter part of the decade has become poorer by evidencing the fact that there is no guarantee of a sustained recovery over the medium to long term, immediately after the civil war [12]. Consequently, the country ended up the decade with lower economic performance and a lack of enthusiasm.

Various theoretical and practical explanations came up with rationalizing this situation and providing strong causations. Many researchers emphasized the fact that the minimal role of the private sector in Sri Lanka is such root cause to lower the economic performance of post war Sri Lanka. As the [13] emphasized a vibrant and healthy private sector as a necessary factor in post conflict societies in order to reach long term development and peace by creating jobs and improving incomes. Even though the Sri Lankan government took many policy decisions such as the development of initial infrastructure, concessions, etc., to encourage private investment in the post-war period, the country's economic performance has not been favorable as expected.

As Table 1 highlights, Sri Lanka's investment to Gross Domestic Production (GDP) ratio has improved over the post-independence era by showing a significant improvement. But still, it has been lower than the powerful economic giants in South Asia and Southeast Asia who created an economic miracle possible with the power of private investment. Even though Sri Lanka has been maintained a significant level of investment relative to GDP, data of the Central Bank of Sri Lanka (CBSL) stressed the fact that the majority of the proportion of investment arisen not based on the public sector but on the private sector. The average share of public investment on GDP in the first two decades (2000 – 2009 and 2010 -2019) of this century was 5.6 percent and 4.9 percent respectively [9]. This situation provides the importance of the private sector in uplifting the overall investment in the economy to a favorable level required to reach the expected economic performance.

Table 1. Total Investment as a Percentage of GDP

Period	Sri Lanka	India	Indonesia	Malaysia	Korea	Singapore	Thailand
1960-69	15.6	16.1	16.9	16.2	18.7	19.4	19.4
1970-79	17.5	19.2	18.6	23.7	29.0	39.6	25.8
1980-89	26.2	22.4	25.9	30.7	33.2	41.1	29.4
1990-99	24.9	26.7	29.5	36.3	37.0	34.7	36.5
2000-10	25.5	34.3	25.0	23.0	32.2	25.2	24.9
2010-19	31.7	34.1	33.9	24.5	31.2	27.3	24.7

Note. World Development Indicators of the World Bank

On the other hand, statistics of public financing and public debt in Sri Lanka clearly indicate the government's expansion throughout the period under consideration clearly. Sri Lanka is considered as a country with higher public expenditure among its peer developing counterparts and south Asian neighbors [14]. But

precisely, the mean percentage of GDP spent on government expenditure during the period of 2010-2019 was 19 percent which is relatively lower than the previous experiences. Moreover, 17.3 percent can be identified as the least public expenditure to GDP ratio that Sri Lanka reported during that period, while 20 percent as the extreme case. Being a welfare state is the common and popular justification for Sri Lanka's higher public expenditure situation [15]. But the worsen picture can be seen once the public expenditure tally with the current account balance and overall fiscal balance of the country; which report continuous deficit over the time. During the period of 2010-19 also, mean ratio of current account deficit to GDP and total fiscal deficit to GDP was 1.3 percent and 6 percent respectively.

This broadened fiscal deficit combined with the government's requirement of financial resource for development projects increase demand for loanable funds directly and that has been caused to inferior public debt environment of the country. Accumulation of public debt throughout the past few decades have intensified the burden further which led credit rating agencies; Fitch and Standard & Poor's to downgrade Sri Lanka's rating in 2018. As [16] stressed that public debt makes a negative impact on GDP per capita growth once it cross the threshold level of public debt for Sri Lanka which is 59.42 percent of debt to GDP ratio. But as Figure 1 emphasize, Sri Lanka debt to GDP ratio has surpassed the threshold value long ago which emphasize the negative impact of debt on economic growth of the country. Given the situation, it is extremely important to understand whether the public sector limits private sector contribution towards economic performance of Sri Lanka during post war period. Hence, this paper mainly focus on investigating the two questions of whether the private investment has an impact over economic growth of Sri Lanka during the post war period (2010 – 2019) and whether the public sector (public debt and public expenditure) have a negative impact over country's private investments during the considered period.

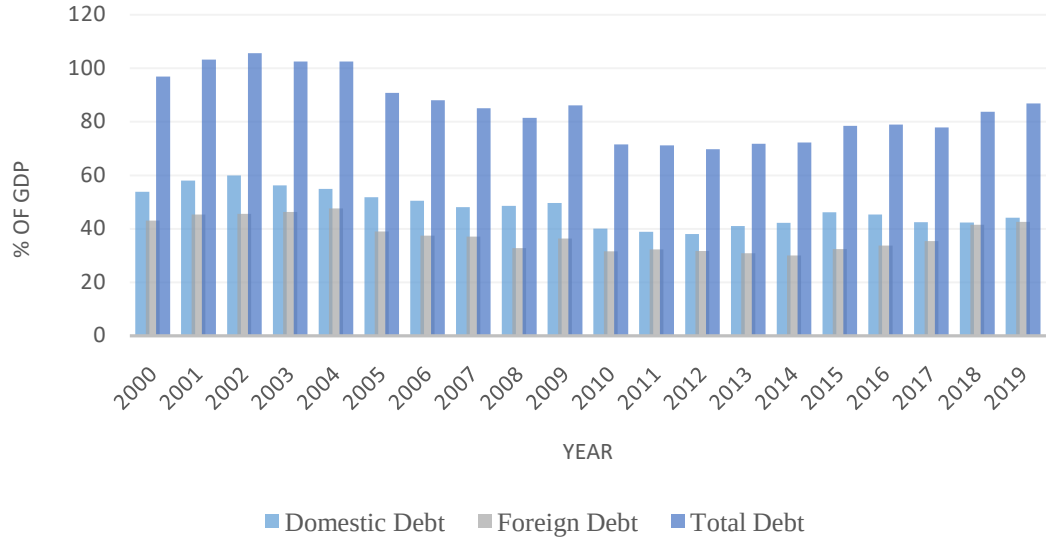

Figure 1. Total, Domestic and Foreign Debt of Sri Lanka as share of GDP (2000-2019)
Source. Central Bank of Sri Lanka Annual Report (2019)

III. THEORETICAL BACKGROUND

Impact of investment on economic growth was a focal point of the theoretical and empirical debates in economics since the beginning. Neo-classical growth model (Solow- Swan growth model) [17] [18] provides strong theoretical explanation regarding the long-term economic growth by considering the capital accumulation, labor or population growth and increasing productivity while endogenous growth theory attempts to explain the economic growth by looking at investment in human capital, innovation, and knowledge as main factors. Literature provides considerable emphasis regarding the significance of public investment which creates impacts on economic performance through both aggregate demand and aggregate supply [19]. Nevertheless, the importance of private investment in economic growth cannot be diluted, and empirical evidence supports the fact that private investment leads to adopting new technologies, creating employment opportunities, and growing income which ultimately leads to economic growth [20].

Keynesians also highlight the importance of public expenditure in economic growth by multiplier effect of the economy. Which means an initial change in government expenditure creates higher employment, profitability and investment which can have a greater impact on the aggregate demand hence, final level of equilibrium national income. But this link between public and private investment has been a controversial point

of economics for a long period of time. Government has the responsibility and potential to stimulate the private sector through the provision of basic infrastructure and favorable environment which improve the productivity and overall availability of capital [20]. Also, public goods and services supply by the government is highly important to create a stable and secured macro-economic environment which leads to reduce the opportunity cost and thus, to encourage private investment.

On the other hand, many Economists who oppose the above claim argue that public investment has a crowding out impact over private investment. This situation can be arisen due to several causes. Firstly, government increases the future tax and domestic interest rate to fulfill the additional public investment requirements. Secondly, public sector produces investment goods that directly compete with private goods. Also, government utilizes the additional physical and financial resources, which would otherwise be available to the private sector. Overall, this leads economic growth to slow down due to the reduction of private investment known as crowding out effect of public on private investments [21].

IV. METHODS AND MATERIALS

4.1 Research data and sources

This study used quarterly data covering the period from 2010-2019 and data were extracted from annual reports of Central Bank of Sri Lanka (CBSL).

4.2 ARDL Bounds Tests for Cointegration

To investigate the hypothesis, the study employs the Auto Regressive Distributed Lag (ARDL) bound testing approach [22] [23]. This method has been widely used due its' advantages against the traditional approaches such as Engel Granger [24] and Johanson[25]cointegration. Firstly, there are no limitations regarding the integrated order of the variables under consideration and ARDL approach can be applied when the under-lying variables are integrated of order one I(1), order zero I(0) or when fractionally integrated. Secondly, this approach is insensitive with sample size which means the possibility of using even with the small samples without any cost [26]. Also, ARDL approach assumes that only single reduced form equation relationship exists between dependent and independent variables hence, enables to estimate long run relationship easier [2]. Fourthly, it gives unbiased estimates and valid t-statistics. Finally, ARDL approach allows to estimate Error Correction Model (ECM) through a simple linear transformation and without losing long run information [27]. The ARDL model used in this study is expressed as follows:

$$\Delta GRO_t = \alpha_0 + \sum_{i=1}^{n} \alpha_{1i}\Delta GRO_{t-i} + \sum_{i=0}^{n} \alpha_{2i}\Delta LPI_{t-i} + \sum_{i=0}^{n} \alpha_{3i}\Delta LF_{t-i} + \sum_{i=0}^{n} \alpha_{4i}\Delta LCPS_{t-i} + \sum_{i=0}^{n} \alpha_{5i}\Delta TOT_{t-i} + \beta_1 GRO_{t-1} + \beta_2 LPI_{t-1} + \beta_3 LF_{t-1} + \beta_4 LCPS_{t-1} + \beta_5 TOT_{t-1} + \mu_t \quad (1)$$

$$\Delta LPI_t = \alpha_0 + \sum_{i=1}^{n} \alpha_{1i}\Delta LPI_{t-i} + \sum_{i=0}^{n} \alpha_{2i}\Delta LGDP_{t-i} + \sum_{i=0}^{n} \alpha_{3i}\Delta LDD_{t-i} + \sum_{i=0}^{n} \alpha_{4i}\Delta LFD_{t-i} + \sum_{i=0}^{n} \alpha_{5i}\Delta LCPS_{t-i} + \sum_{i=0}^{n} \alpha_{6i}\Delta INTR_{t-i} + \beta_1 LPI_{t-1} + \beta_2 LGDP_{t-1} + \beta_3 LDD_{t-1} + \beta_4 LFD_{t-1} + \beta_5 LCPS_{t-1} + \beta_6 INTR_{t-1} + \mu_t \quad (2)$$

$$\Delta LPI_t = \alpha_0 + \sum_{i=1}^{n} \alpha_{1i}\Delta LPI_{t-i} + \sum_{i=0}^{n} \alpha_{2i}\Delta LGDP_{t-i} + \sum_{i=0}^{n} \alpha_{3i}\Delta LD_{t-i} + \sum_{i=0}^{n} \alpha_{4i}\Delta INTR_{t-i} + \sum_{i=0}^{n} \alpha_{5i}\Delta LCPS_{t-i} + \beta_1 LPI_{t-1} + \beta_2 LGDP_{t-1} + \beta_3 LD_{t-1} + \beta_4 INTR_{t-1} + \beta_5 LCPS_{t-1} + \mu_t \quad (3)$$

$$\Delta LPI_t = \alpha_0 + \sum_{i=1}^{n} \alpha_{1i}\Delta LPI_{t-i} + \sum_{i=0}^{n} \alpha_{2i}\Delta LGDP_{t-i} + \sum_{i=0}^{n} \alpha_{3i}\Delta LGEX_{t-i} + \sum_{i=0}^{n} \alpha_{4i}\Delta LEX_{t-i} + \sum_{i=0}^{n} \alpha_{5i}\Delta INTR_{t-i} + \beta_1 LPI_{t-1} + \beta_2 LGDP_{t-1} + \beta_3 LGEX_{t-1} + \beta_4 LEX_{t-1} + \beta_5 INTR_{t-1} + \mu_t \quad (4)$$

The associated error correction models of the above private investment models are specified as follows:

Based on model (1)

$$\Delta GRO_t = \alpha_0 + \sum_{i=1}^{n} \alpha_{1i}\Delta GRO_{t-i} + \sum_{i=0}^{n} \alpha_{2i}\Delta LPI_{t-i} + \sum_{i=0}^{n} \alpha_{3i}\Delta LF_{t-i} + \sum_{i=0}^{n} \alpha_{4i}\Delta LCPS_{t-i} + \sum_{i=0}^{n} \alpha_{5i}\Delta TOT_{t-i} + \partial ECM_{t-1} + \mu_t \quad (5)$$

Based on model (2)

$$\Delta LPI_t = \alpha_0 + \sum_{i=1}^{n} \alpha_{1i}\Delta LPI_{t-i} + \sum_{i=0}^{n} \alpha_{2i}\Delta LGDP_{t-i} + \sum_{i=0}^{n} \alpha_{3i}\Delta LDD_{t-i} + \sum_{i=0}^{n} \alpha_{4i}\Delta LFD_{t-i} + \sum_{i=0}^{n} \alpha_{5i}\Delta LCPS_{t-i} + \sum_{i=0}^{n} \alpha_{6i}\Delta INTR_{t-i} + \partial ECM_{t-1} + \mu_t \quad (6)$$

Based on model (3)

$$\Delta LPI_t = \alpha_0 + \sum_{i=1}^{n} \alpha_{1i}\Delta LPI_{t-i} + \sum_{i=0}^{n} \alpha_{2i}\Delta LGDP_{t-i} + \sum_{i=0}^{n} \alpha_{3i}\Delta LD_{t-i} + \sum_{i=0}^{n} \alpha_{4i}\Delta INTR_{t-i} + \sum_{i=0}^{n} \alpha_{5i}\Delta LCPS_{t-1} + \partial ECM_{t-1} + \mu_t \quad (7)$$

Based on model (4)

$$\Delta LPI_t = \alpha_0 + \sum_{i=1}^{n} \alpha_{1i}\Delta LPI_{t-i} + \sum_{i=0}^{n} \alpha_{2i}\Delta LGDP_{t-i} + \sum_{i=0}^{n} \alpha_{3i}\Delta LGEX_{t-i} + \sum_{i=0}^{n} \alpha_{4i}\Delta LEX_{t-i} + \sum_{i=0}^{n} \alpha_{5i}\Delta INTR_{t-i} + \partial ECM_{t-1} + \mu_t \quad (8)$$

As mentioned above, the objective of this study can be divided into two separate components. Firstly, the study attempts to investigate whether the private investment has an impact on economic growth of Sri Lanka during the period of 2010 to 2019. Model 1 is an extended version of Solow-Swan growth model it has been applied for the investigation. Secondly, study carries out three models to investigate the crowding out/in impact of public sector on private investment by employing different public sector variables. Model 2 looks into the impact of crowding out effect of two components of public debt; domestic and foreign debt while model 3 considers the crowding out/in effect of total debt. Contrastingly, model 4 takes government expenditure into account in order to investigate its' impact over private investment of Sri Lanka in post war period. Description of the variables related to all the four models are shown in Table 2.

Table 2. Discription of the Variables

Variable	Description	Source
LGDP	Log of Gross Domestic Production	Central Bank of Sri Lanka
LGEX	Log of Government Expenditure	Central Bank of Sri Lanka
LPI	Log of Private Investment[a]	Central Bank of Sri Lanka
LLF	Log of Labour Force	Central Bank of Sri Lanka
LCPS	Log of Credit to Private Sector	Central Bank of Sri Lanka
LD	Log of Total Public Debt	Central Bank of Sri Lanka
LDD	Log of Domestic Debt	Central Bank of Sri Lanka
LFD	Log of Foreign Debt	Central Bank of Sri Lanka
INTR	Interest Rate[b]	Central Bank of Sri Lanka
TOT	Terms of Trade	Central Bank of Sri Lanka
LEX	Log of Exports	Central Bank of Sri Lanka

Nate. Author's compilation
[a] Gross Fixed Capital Formation was used as a proxy for the Private Investment
[b] Average Weighted Lending Rate was used as a proxy for the Interest Rate

V. EMPIRICAL RESULTS

Before proceed with the ARDL bound test, normal practice is to test the stationarity of the variable under consideration to check whether the variables are integrated as required. ARDL approach can be employed only if variables are integrated of order one I(1) or zero I(0). It is not possible to interpret the F statistics provided by [23] if the variables are integreated of order two I(2) [26]. Thus, Augmented Dickey Fuller (ADF) and Phillips Perron (PP) unit root tests were carried out in order to check the stationarity of the variables (Table 3).

Table 3. Results of ADF unit root test

Variable	**Stationarity of all variables in levels**		**Stationarity of all variables in first differences**	
	Without trend	**With trend**	**Without trend**	**With trend**
	Augmented Dickey Fuller (ADF) Test			
GRO	-1.369	-2.214	-4.0706***	-3.995**
LGDP	-2.503	-3.651*	-3.492**	-2.323**
LGEX	-1.687*	-5.642	2.541**	4.623**
LPI	-2.511	-3.838**	-6.761***	-7.146***
LLF	-1.932	-3.143	-6.310***	-6.285***
LCPS	-0.957	-4.857***	-2.596*	-2.664**
LD	-0.816	-2.643	-4.173***	-4.244**
LDD	-0.829	-1.774	-5.608***	-5.615***
LFD	-0.507	-1.371	-2.923*	-3.569*

INTR	-3.214**	-3.684**	-3.949**	-3.996**
TOT	-2.456	-1.373	-3.779**	-4.163**
LEX	2.316	2.458	2.145*	4.651**
Phillips-Perron (PP) Test				
GRO	-8.384***	-18.925***	-27.915***	-28.687***
LGDP	-4.757	-3.589*	-8.524***	-17.405***
LGEX	5.236	1.236	5.614*	2.367**
LPI	-1.596	-3.334*	-9.886***	-11.299***
LLF	-2.361	-3.096	-7.383***	-8.433***
LCPS	-1.845	-1.951	-2.417*	-2.911**
LD	-1.218	-2.457	-3.651**	-3.164
LDD	-0.896	-0.681	-5.608***	-5.614***
LFD	-0.503	-1.371	-5.119***	-5.150***
INTR	-2.353*	-2.162*	-2.424**	-2.241***
TOT	-2.850*	-4.1903**	-22.037***	-22.011***
LEX	5.641*	2.364*	1.264*	5.264**
Note: *, ** and ** denotes stationarity at 10%, 5% and 1% respectively.				

The result postulates that the non-stationary is presented in majority of the variables at its' level form which leads to accept the null-hypothesis of the series are not stationary. Against that the ADF and PP tests were applied to the first difference of the data series which reject the null hypothesis of non-stationarity for all the variables used in this study. Therefore, it can be concluded that all the variables under consideration are integrated of order one or zero but not in order two.

Table 4. Bounds F-test for cointegration.

Dependent	**Function**	**F-Statistic**	**Cointegration status**
GRO	F(GR|LPI, LF, LCPS, TOT)	13.996***	Cointegrated
LPI	F(LPI|LDD, LFD, LGDP, INTR, LCPS)	43.002***	Cointegrated
LPI	F(LPI|LD, LGDP, INTR, LCPS)	154.819***	Cointegrated
LPI	F(LPI|LGE, LGDP, INTR, LCPS, LEX)	3.759*	Cointegrated

Asymptotic Critical Values[a]					
1%		5%		10%	
I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
2.82	4.21	2.14	3.34	1.81	2.93

Note. *, ** and *** denotes statistical significance at 10%, 5% and 1% level, respectively
[a] F-critical values are obtained from (Pesaran, et al., 2001) for k=5
Source: Data generated using Eviews.

ARDL bounds testing procedure is based on two stages. Firstly, cointegrating relationships among the variables in ARDL model are estimated by conducting an Ordinary Least Squares (OLS) F-test for the joint significance of the coefficients. Two sets of critical values for a given significant level can be determined based on two assumptions; all variables included in the ARDL model are integrated of order zero and all the variables are integrated of order one.If the value of the test statistic exceeds the upper critical bound value I(0), null hypothesis of non-cointegration is rejected while it is accepted if the F-statistic is lower than the lower bounds value [26].Estimated F-statistics of respective models are reported in Table 4. As the estimated F-statistics are higher than the upper-bound critical values at least under the 90 percent of confidence level, it is clear that there are long run relationships among the variables of all the four models.

Table 5. Estimated long-run coefficients

Regressors	Model 1 AIC (3,1, 2, 3, 0, 3)	Model 2 AIC (2,2,0,3,2,0)	Model 3 AIC (1,0,0,3,2,0)	Model 4 AIC (1,0,0,3,2,0)
C	-1238.258 (-4.181)**	14.741 (11.184)***	49.521 (5.661)**	-38.365 (-1.455)
LPI	21.713 (4.109)**	-	-	-
LF	149.282 (3.891)**	-	-	-
LCPS	-11.350 (-4.253)**	1.342 (9.988)***	5.521 (5.667)**	-2.963 (-1.404)
TOT	-0.296 (-1.859)	-	-	-
LGDP	-	-	8.330 (-4.639)**	6.540 (1.759)*
LGEX	-	-	-	-0.824 (-1.596)
LD	-	-	0.0003 (0.001)	-
LDD	-	-0.829 (-4.856)***	-	-
LFD	-	-0.588 (-4.833)***	-	-
INTR	-	-0.071 (0.006)***	-0.097 (-6.556)**	0.126 (1.509)
LEX	-	-	-	0.799 (0.838)*

Note. *, ** and *** denotes statistical significance at 10%, 5% and 1% level, respectively
Source: Data generated using Eviews.

The second stage involves estimating the long run and short-run coefficients of each ARDL model. Table 5 presents the estimated results of the long-run relationships of respective models. As model 1 indicates the private investment (PI) has a statistically significant and positive long-run impact on economic growth under 95 percent of confidence level. The coefficient of the private investment is 21.71 which highlights the fact; 1 percent increase in private investment leads to 0.22 percent of increase in economic growth in Sri Lanka. The findings are well aligned with what previous studies have reported regarding the role of private investment in economic growth of Sri Lanka [1] [12] [27]. In the long run, the coefficients of labour force (LF) and credit to private sector (LCPS) are statistically significant. Contrary to expectation, credit to private sector is negatively related to economic growth, while as expected, labour contributes to economic growth in the long run in Sri Lanka. However, terms of trade (TOT) is found to be statistically insignificant to economic growth.

Among private investment models (model 2, 3 and 4), only the model 2 provides significant evidence regarding the crowding out effect of government debt. Model 2 has employed domestic debt and foreign debt as two separate variables while results indicate both components crowd out the private investment of the country. As the estimates indicate, 1 percent increase in domestic and foreign debt leads to decline the private investment by 0.82 percent and 0.58 percent respectively. But this situation is not similarly applicable to total debt scenario which does not have a significant impact over private investment (model 3). Similarly, model 4 results highlight that, estimated coefficient of the long-run relationship between public expenditure and private investment is not significant as expected. Contrastingly, there are different variables in three models which create both negative (model 2 and 3; INTR) and positive (model 2: LCPS; model 3: LCPS and LGDP; model 4: LGDP) impact over private investment of Sri Lanka.

Table 6 presents the short run dynamics of the models under consideration. Same as the long run, private investment does have a significant immediate impact on economic growth of Sri Lanka at 1 percent level which means private investment of this particular quarter would lead to increase the economic growth in two quarters later. Regarding the private investment models, only foreign debt has shown a significant negative impact over private investment by substantiating the crowding out hypothesis further (Model 2). Except that, results do not provide evidence to support the crowding out hypothesis related to domestic debt, total public debt and public expenditure over private investment. Results of the other variables indicate that, economic growth and labour force of previous years create a significant and positive impact over the economic growth at 1 percent and 10 percent level respectively. Also, unexpectedly and contradictory with long run estimates, all the three models imply the fact that credit to private sector has a negative impact on the private investment in immediate manner. Additionally, model 3 emphasizes that GDP has a positive and immediate impact on private investment. Overall, the error correction terms of all the four models (ECM (-1)) are statistically significant at least at the 10% level with the expected negative sign and this confirms the cointegration relationship among variables.

Table 6. Error correction representation for the selected ARDL Model				
	Model 1	Model 2	Model 3	Model 4
C	-0.915 (-0.857)	1.353 (0.715)	-0.011 (-0.128)	0.004 (0.061)
DGRO (-1)	0.691 (-4.371)***	-	-	-
DGRO (-2)	-0.249 (-1.524)	-	-	-
DLPI	4.587 (0.683)	-	-	-
DLPI (-1)	-6.514 (-0.941)	0.012 (0.056)	0.181 (0.484)	-0.107 (-0.388)
DLPI (-2)	25.826 (-4.084)***	0.188 (0.864)	0.370 (1.318)	-0.341 (-1.463)
DLF	34.717 (0.709)	-	-	-
DLF (-1)	91.275 (2.024)*	-	-	-
DLF (-2)	-	-	-	-
DLCPS	34.517 (0.818)	1.067 (0.729)	-0.467 (-0.342)	-2.027 (-1.285)
DLCPS (-1)	-34.298 (-0.505)	1.069 (0.722)	3.027 (1.970)*	2.887 (1.385)
DLCPS (-2)	20.691 (0.411)	-4.625 (-2.801)**	-1.44 (-0.914)	-4.094 (-2.010)**
DTOT	0.107 (0.715)	-	-	3.321 (0.004)
DTOT (-1)	0.007 (0.048)	-	-	-
DTOT (-2)	-	-	-	-
DLGDP	-	-	0.501 (0.837)	-
DLGDP (-1)	-	-	-0.350 (-0.465)	-
DLGDP (-2)	-	-	1.291 (-2.326)**	-
DLGEX	-	-	-	-0.019 (-0.060)
DLGEX (-1)	-	-	-	-0.339 (-0.867)
DLGEX (-2)	-	-	-	-0.110 (-0.274)
DLD	-	-	-1.761 (-1.549)	-0.017 (-0.171)
DLD (-1)	-	-	-0.005 (-0.003)	-
DLD (-2)	-	-	1.616 (1.173)	-
DLDD	-	-0.159 (-0.201)	-	-
DLDD (-1)	-	-0.045 (-0.054)	-	-
DLDD (-2)		0.111 (0.136)	-	-
DLFD	-	-1.266 (-1.953)*	-	-
DLFD (-1)	-	-0.687 (0.504)	-	-
DLFD (-2)	-	1.363 (2.413)**	-	-
DINTR	-	0.153 (1.745)	0.025 (0.266)	-0.009 (-0.101)
DINTR (-1)	-	0.069 (0.777)	-0.055 (-0.502)	-0.075 (-0.731)
DINTR (-2)	-	-0.123 (-1.481)	-	-
DLEX	-	-	-	-0.537 (0.356)
DLEX (-1)	-	-	-	-0.303 (-0.688)
DLEX (-2)	-	-	-	-0.515 (-1.305)
DECM (-1)	-0.816 (-2.604)**	-1.232 (-4.081)***	-2.101 (0.057)*	-0.985 (-2.024)*
R-squared	0.917	0.825	0.751	0.745
F-statistic	8.867	3.795	2.414	2.191
Prob(F-statistic)	0.000	0.012**	0.065*	0.062*
Durbin-Watson stat	1.751	1.858	2.127	1.821
Note. *, ** and *** denotes statistical significance at 10%, 5% and 1% level, respectively Source: Data generated using Eviews.				

Table 7.Diagnostic tests for the ECM based ARDL models.				
	Model 1	Model 2	Model 3	Model 4
Serial correlation	0.384 (0.691)	0.859 (0.452)	3.014 (0.945)	0.118 (0.889)
Normality:	6.329 (0.420)	0.438 (0.802)	1.578 (0.454)	0.096 (0.953)
Heteroscadasticity	0.414 (0.945)	1.088 (0.448)	1.846 (0.144)	0.671 (0.157)
Source: Data generated using Eviews.				

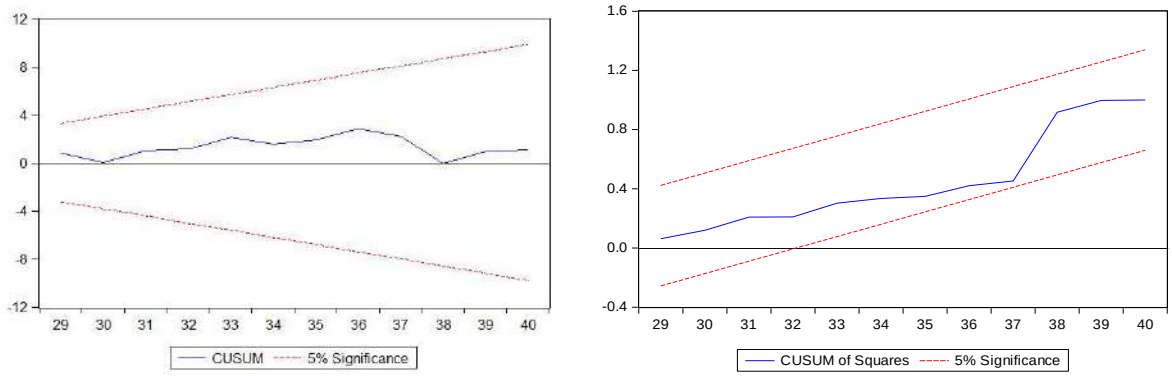

Figure 2. Model 1- cumulative sum of recursive residuals and cumulative sum of squares of recursive residuals plots.
Source: Generated using Eviews 9

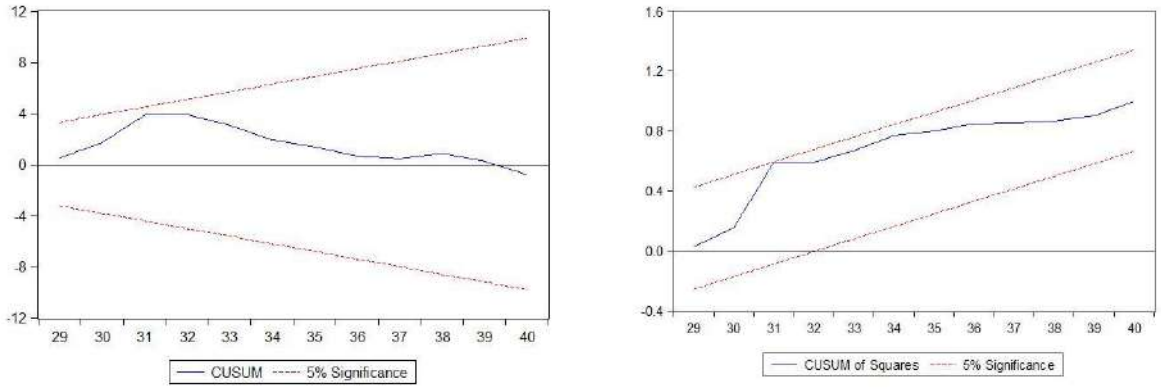

Figure 3. Model 2- cumulative sum of recursive residuals and cumulative sum of squares of recursive residuals plots.
Source: Generated using Eviews 9

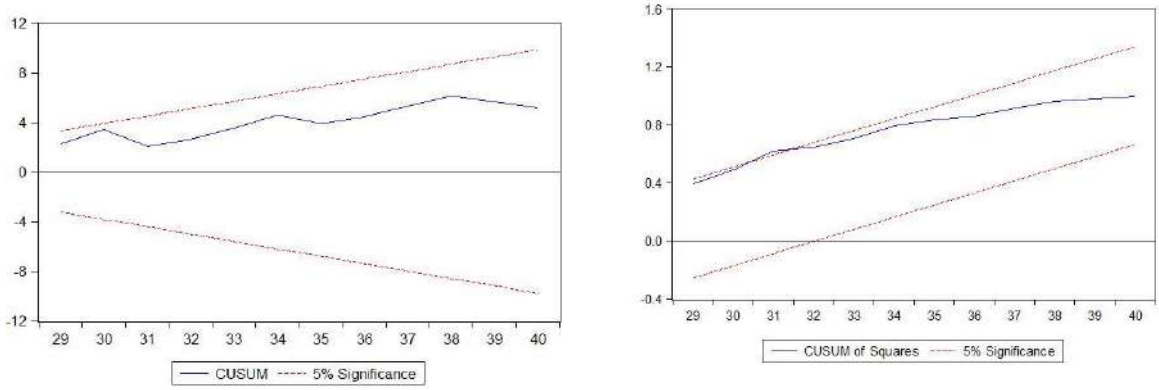

Figure 4. Model 3- cumulative sum of recursive residuals and cumulative sum of squares of recursive residuals plots.
Source: Generated using Eviews 9

Results of diagnostics tests show that all the four models are free from serial correlation, normality and heteroscadasticity (Table 7). Also, all the models (economic growth and private investment) have passed the stability tests as given by the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMQ) plots (Fig. 2,3,4 and 5).

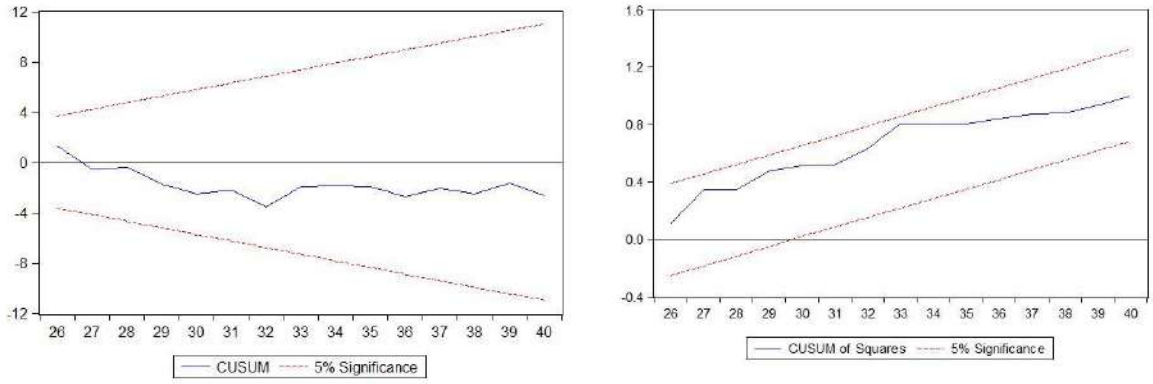

Figure 5. Model 4- cumulative sum of recursive residuals and cumulative sum of squares of recursive residuals plots.
Source: Generated using Eviews 9

VI. CONCLUSION

This study mainly focused on two objectives; whether the private investment has an impact on economic growth and whether the public sector creates obstacles on the private sector which is known as the crowding-out effect. To reach this objective, 4 models were employed with slight variations. As the long-run estimates reveal, private investment has a positive and significant impact on the economic growth of Sri Lanka in the post-war period. This means the government's intention to expand the private sector would be an influential and effective policy decision that can boost economic growth. On the other hand, as mentioned at the beginning, the country failed to achieve the prospected level of economic progress in the previous decade given the fact that the government had given considerable space for the private sector in the economy. To investigate this particular situation deeply, the concept of crowding out/in effect was taken into consideration as it says, even though private investment has a positive impact on economic growth that can be restricted by the negative impact created by the public sector. The study, examined the impact of foreign debt, domestic debt, total public debt, and public expenditure on private investment by employing three different models. As the results revealed, only domestic debt and foreign debt have a negative and significant impact on private investment while the impact of total debt and public expenditure on private investment is insignificant. Hence, it can be concluded that in the long-run foreign debt and domestic debt crowded out the private investment of Sri Lanka during the past decade. On the other hand, in the short run, results emphasize the positive, significant, and immediate impact that private investment has on economic growth. But among the investment models, only foreign debt indicates a significant relationship with the private investment which is negative hence, crowding out effect. Given the findings, as previously substantiated theoretically and practically, it can be concluded that private investment can be used to stimulate the economic growth of the country. Nevertheless, this positive impact is severely affected by the negative impact of foreign debt and domestic debt of Sri Lanka. Thus policy makers need to take action towards reducing the public debt of Sri Lanka to stimulate growth. Specifically, it is direly needed to pay more attention towards the foreign debt as it creates an immediate negative impact on private investment. Hence, by giving appropriate attention to reduce foreign debt, Sri Lanka can stimulate the economic growth of the country in the short term till government will be able to manage the debt repayment in an optimal manner.

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