International Journal of Business and Social Research

Volume 08, Issue 08, 2018: 01-10
Article Received: 28-06-2018
Accepted: 13-08-2018
Available Online: 22-08-2018
ISSN 2164-2540 (Print), ISSN 2164-2559 (Online)
DOI: http://dx.doi.org/10.18533/ijbsr.v8i8.1122

The Impact of Public Debt on Private Investment: Sri Lankan Experience

H.R.A.C. Thilanka[1], J.G Sri Ranjith[2]

ABSTRACT

Governments tend to borrow financial resources from domestic as well as external sector when its tax revenues are not sufficient to meet the required financial needs. In the Sri Lankan context, there has been a gradual increasing trend in the accumulation of public debt since the post liberalization phase. Herein, this ambience of public debt has caused to make congenial effects while leading to some unfavorable effects on the economy. Hence, this study examines the impact of public debt on private investment in Sri Lanka using the annual data for the period 1978-2015. The study follows some econometric steps respectively unit root test, Johansen co-integration test and finally employing the Vector Error Correction Model (VECM) to find out the long-run impact. Empirical findings of our study show the evidence for the presence of crowding-in effect of public debt on private investment in the long-run implying that government has diverted borrowing funds as spurring private sector. Further, real GDP also affects positively on private investment suggesting further expansion of the economy is inevitable. Hence, the policy compilation with regard to fiscal operations should be aimed at the well- managed borrowing for the purpose of boosting private investment further.

Keywords: Crowding out/in Effect, Government Spending, Public Debt, Private Investment, Vector Error correction Model.
JEL Codes: C22, E62, G11, H5, H63.

1. Introduction

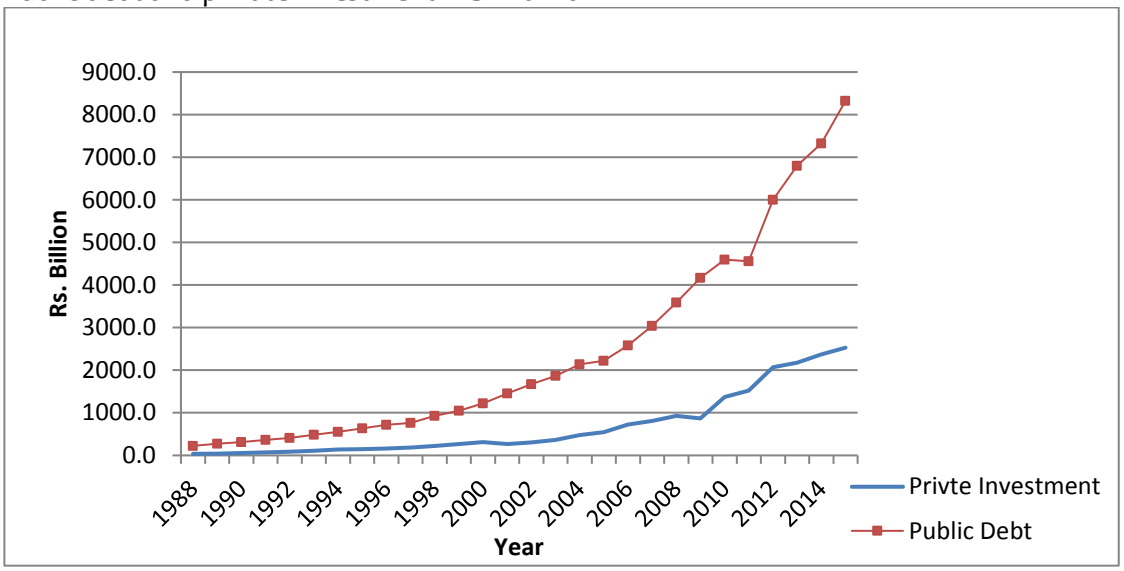
Government debt can be considered as one of the major sources for financing the government operational activities under the fiscal policy. Nevertheless there are many criticisms against government's borrowings as it may lead to a debt trap problem and thereby country's development process gets into a stalemate situation, but it will not be a detrimental impact always on the economy if borrowings are efficiently and productively used. For instance, if borrowed funds are used for long term development programs it will be advantageous for the country as higher returns reach economy.

[1] Corresponding author, Assistant Lecturer, Department of Economics and Statistics, University of Peradeniya, Sri Lanka. Email: hrathilanka@gmail.com, Tel: +94713678735
[2] Senior Lecturer, Department of Economics and Statistics, University of Peradeniya, Sri Lanka. Email: sri_ranjith@hotmail.com, Tel: +94775393462

Furthermore borrowings play a major role in solving the Balance of Payment difficulties. Since borrowings pave the way to utilize resources than the potential resource level owned a country, it is not inherently bad for a country. According to Chaudhary and Anwar (2000) under debt cycle theory a country borrows in the first stage generate additional resources and is able to stand on its own feet in the second stage. Finally the country may emerge as surplus of resources and it can therefore repay the loans in the third stage. This process helps recipient countries to sustain and accelerate the economic growth.

Relatively a high level of debt service payment impedes the flowing resources towards the development projects and leads to increase the demand for loanable funds that resulting broadening the fiscal deficit. Sri Lankan experience shows the accumulation of public debt has recorded an increasing trend in both foreign and domestic debt during last few decades. After significant changes happened in monetary policy with the introduction of liberalization economic policy in 1977 the level of public debt also increased for the purpose of development activities. As a result, the total public debt as a percentage of GDP was 68.6 in 1977 increased up to 103.3 in 2001 (CBSL, 2015). Along with public debt, large debt service ratio, growing fiscal deficit, and limited and low level of tax revenue caused further borrowings to the government.

Figure 1: Public debt and private investment in Sri Lanka



Source: Annual Reports, Central Bank of Sri Lanka, 2015

With the end of Sri Lanka's civil war in 2009, investment has become one of the dynamic forces leading the country to well-equipped economy through infrastructure development. Public investment in infrastructure development made private sector to hold a significant portion of the total investment. In 2014 private investment as a percentage of GDP was 22.9, while public investment was only 6.8 (CBSL, 2014). Therefore, private investment has recorded a slightly increasing trend over the last few decades. Figure 1 shows the behavior of public debt and private investment in Sri Lanka over the last few decades.

Meanwhile, the revenue especially tax revenue is at a low level compared to public debt and this ambience intensifies the high level of accumulated public debt issue due to the difficulty to finance public debt. So, it is apparent that the private sector and its investment are not strong enough to raise a high level of tax revenue for the government to bear with the public debt accumulation. Under this backdrop, it is inevitable to spur more private investment as a means of acceleration the economic activities of the country. Hence, examine the impact of public debt on private investment in Sri Lanka is temporal important.

2. Literature review

Theoretically, crowding-out effect is the one of the main concepts which explains the relationship between public debt and private investment and it has been vastly discussed by different

economists who belong to different schools. According to the neoclassical view, budget deficits crowd out private investment through having a positive relationship with interest rates. Positive budget deficits cause an increase in the demand for loanable funds which lead to an increase in interest rates, when funds are obtained from banking sources. Under the Ricardian Equivalence view there would be no crowding-out of private investment when the government borrows money, because people will reduce consumption and increase saving in order to offset the increase in future tax liabilities which they foresee as a result of government spending deficits (Carrasco, 1998). Keynesian economists argued that public investment through the government spending increases private investment results in crowding-in effect because of the multiplier effect (Saeed *et. al.,* 2006). In contrast, conservative economists argue that government spending cannot possibly increase overall economic activity. If the spending is financed by tax increases, this will reduce individuals'after-tax income and therefore reduce their spending. If it is financed through borrowing, the increased government demand for loans will drive up interest rates, and this will crowd-out private investment. The extreme versions of this theory, known as "dollar- for- dollar" crowding-out argue that the decrease in private investment will exactly offset by the increase in government spending (Reuss, 2009).

Hence, this theoretical aspect posits the nature of the relationship between public debt and private investment under various schools of thought and ended up with different conclusions. Therefore, in this study, we expected to examine the existence of crowding out/in effect of public debt on private investment under the Sri Lankan context with the purpose of providing a clear idea on the impact of public debt on private investment in Sri Lanka.

Existing empirical studies have focused on this debatable causal relationship between the private investment and public debt. According to Abdullahi *et. al.,* (2016) debt overhang and crowding-out effects have negatively affected the positive development of capital formation being one of the essential macroeconomic variables for a sustained economic development. Further, External borrowing is awash with the perceived negative relationship between foreign debt and investment which consequently results into lower capital formation. Krugman (1988) defines this negative relationship as "debt overhang" where the potentials of repayment of outstanding facilities fall lower than the signed value in Zambia. Similarly, based on this debt overhang effect, Koeda (2008) pointed out that the larger the initial debt, the stronger the incentives a low-income country has to manage its debt at a low interest rate by becoming permanently aid dependent. The lower low-income countries' initial income, the more it tries to borrow a larger quantity of concessional loans to raise both investment and consumption in the short- run and thus becomes more likely to be trapped in the low steady state. Abilene *et. al.,* (2007) explain that in the debt overhang hypothesis external debt causes a negative effect on investment. The debtor country cannot benefit fully from an increase in production. The reason is, a part of the production goes to creditor countries to pay the debt service and this point is a consideration for investment and production decisions.

According to a study conducted by Bai *et. al.,* (2016) based on China, local governments have used their new access to financial resources to facilitate favored businesses' access to capital, which potentially worsens the overall efficiency of capital allocation. The long-run effect of off-balance-sheet spending by local governments may be a permanent decline in the growth rate of aggregate productivity and GDP in China. Another study conducted by Akram (2013) found that both public external debt and debt servicing negatively affect economic growth and investment, which points to the existence of the "debt overhang effect" and the "crowding out effect". Similarly, domestic debt also exhibits a negative and significant relationship with economic growth and investment in South Asian Countries. In line with this study Shah and Pervin (2012) found a long run significant negative effect of external public debt service and positive effect of external public debt stock on GDP growth in Bangladesh. In short run, only external debt service has negative effect, but the debt stock does not have any significant effect. Thus the investigation did not find any evidence of debt overhang provided that there is no significant adverse effect of debt stock on GDP growth, but crowding out effect was originated from the fact that there is evidence of adverse effect of debt service payment on economic growth. Moreover, Hussain *et al., (*2015) found the existence of debt Laffer Curve in sub-Saharan countries. If the burden of debt is too high then there is a negative impact of debt on the economic growth.

According to a study conducted by Apere (2014) the impact of domestic debt on private investment in Nigeria is linear and positive; and the impact of external debt on private investment in Nigeria is U-shaped. Unless external debt as a ratio of GDP reaches some threshold value that is large enough for meaningful investment the impact of external debt on private investment in Nigeria will always be negative. Similarly, a study based on Nigeria (Akomolafe, *et. al.,* 2015) found that domestic debt crowds out domestic investment in both short run and long run showing the existence of crowd out effect of domestic debt on investment in two periods. However, external debt crowds in domestic investment in the long run indicating external debt does not crowd out investment in the long run, but only in the short run. Meanwhile, King'wara (2014) pointed out that high levels of domestic borrowing have negatively impacted on private investment and the impact of public investment on private investment was not as significant as public domestic debt, GDP and interest rate variable suggesting that public investment has not been complementary on private investment in Kenya. Further, Nigeria's external indebtedness has become a burden and it is unsustainable. It crowds out private investment and discourages output growth, has a negative impact on social and economic infrastructure and aggravating poverty and inequality (Adegbite *et. al.,* 2008). Slimani (2016) found that there is evidence of a double threshold effect of the fiscal balance in developing countries. When exceeding a budget deficit level of 4.8% of GDP or a fiscal surplus level of 3.2% of GDP, economic growth is negatively affected. Second, the sign of the relationship between budget deficit and economic growth is conditioned by the level of total investment. For values of total investment higher than 23%, it follows that there is a positive relationship. However, it becomes negative, when investment falls below this threshold. Moreover, a timely conceived, but slowly implemented stimulus can have undesirable crowding out effects up front that may in fact be large enough to eventually offset its desired impact altogether in Euro are (Kirchner and Wijnbergen, 2016). And also, when leverage-constrained banks accumulate sovereign debt, private access to credit is reduced through a new crowding out mechanism.

In contrast, according to a study conducted by Majumder (2007) pointed out that findings of the study do not collaborate the crowding out hypothesis in Bangladesh, rather, provide the evidence of crowding in effect. In Pakistan, there is a complementary relationship between public and private investment. The rejection of crowding out hypothesis suggests that an increase in public investment would result in an increase in both private investment and GDP growth (Hyder, 2001). Similarly, government current transfer spending, government current spending, and government interest spending crowd out private investment, whereas government capital spending crowds-in private investment in Turkey (Sen and Kaya, 2013). Further, findings of a study provide the evidence of crowding in effect, which explains the direction of public expenditures towards private sector through contractors, politicians and bureaucrats, instead of public projects. The provision of subsidy, transfer payments, and substantial amount of micro-credit also explain the phenomenon on of crowding in (Khan and Gill, 2009). Likewise, a study conducted by Ray and Lng (2016) found that decades of under-investment and poor asset management have left Indonesia with a major infrastructure deficit, the economic and social costs of which are substantial. However, under fiscal policy, recently regulations are introduced and government spending augurs well for new flows of private investment

Under Sri Lankan context, accumulated public debt over the years has reached high proportions that debt servicing has become a major challenge for the government. Sustainability of public debt is an issue that involves macroeconomic variables and a durable solution requires addressing the issue at the macro level (Fonseka and Ranasinghe, 2007). And also, public debt is not sustainable, so that a switch is required from traditional sources of foreign debt to emerging sources of financing of fiscal deficit or deficit reduction (Dayaratna-Banda and Priyadarshanee, 2014). Public borrowing from commercial bank and government expenditure has more significant positive impact on financial development in Sri Lanka. But, it is not possible to ignore the potential threat emerged from crowding out effect on financial intermediation (Rathnasiri and Wijesinghe, 2012). Further, a nonlinear relationship between the public debt and GDP per capita growth exists in Sri Lanka. The threshold level for public debt is 59.42 per cent of GDP. Above this level, public debt makes a negative impact on GDP per capita growth (Kumara and Cooray, 2013). Meanwhile, Deshapriya (2012) pointed out that stance of the fiscal policy is unsustainable during the considered time duration. Moreover, the results pointed out that growth rate of GDP, budget deficit, political instability and time trend positively affect to increase the net total public debt.

Hence, it is apparent that the effect of government borrowings on GDP, economic growth and private investment of a country is ambiguous and seemingly a contextual phenomenon. Also debt overhang and crowding out effects affect the countries' economies in different ways. Regarding the Sri Lankan context, empirical studies have shown that debt is not maintained at a sustainable level and high level of debt, as currently Sri Lanka is confronted with, is a difficult challenge. However, most of the existing literatures do not support or give clear policy directions as to emphasis the impact of public debt including both domestic and external debt on private investment in Sri Lanka. With this regard, to fill the knowledge gap of the existing literature, this study mainly aims at identifying a crowding in/out effect of public debt on private investment in long run/short run Sri Lanka.

3. Data and methodology

3.1 Research data and sources

This study used annual data covering the period from 1978-2015 and data were extracted from annual reports of Central Bank of Sri Lanka. All variables were transformed into logarithm form.

3.2 Model specification and estimation

Number of researchers has employed time series econometric methods following ADF tests, co-integrating test and Vector Error Correction Model (VECM) in order to find out a crowding out/in effect related to public debt and private investment (Hyder, 2001; Majumder, 2007; Khan & Gill, 2009; Sen & Kaya, 2013; King'wara, 2014; Akomolafe *et al.* 2015). Since these studies mainly focus on identifying long run / short run impact stemming the crowding in/out effect, this study also employs the VECM in order to accomplish the objectives of the study.

$$PI = f(DD, EXD, RGDP) \quad (1)$$

This function can be written as a regression.

$$LPI_t = \beta_0 + B_1 LDD_t + \beta_2 LEXD_t + \beta_3 LRGDP_t + u_t \quad (2)$$

Where, variables LPI, LDD, LEXD and LRGDP denote respectively logarithm of private investment, logarithm of domestic debt, logarithm of external debt and logarithm of Real Gross Domestic Product. u is the white noise error term, t is the time period (1978-2015).

As most of time series are non-stationary, spurious regression problem exists at most of time. In order to avoid this problem, it has become a standard practice to begin the analysis with prior determination of unvaried properties of the time series (Khan and Gill, 2009). A long run relationship can exist when series follow the same order of integration. Moreover, a combination of stationary series can be identified from a non-stationary series through co-integrating techniques. Tests which are related to co-integration mainly involve with two steps namely identifying the presence of non-stationary (unit root) and long run relationship between variables.

In order to identify the existence of non-stationary or unit root, some standard unit root tests can be followed such as Augmented Dickey-Fuller (ADF) test, Phillips-Perron (PP) test and Kwaitkowski-Phillps-Schmidt-Shin (KPSS) test. This study uses ADF and PP unit root tests. The general ADF test is shown in equation (3).

$$\Delta X = \alpha + \delta X_t - 1 + \sum_{J=2}^{q} \delta \Delta X_{t-j} + \varepsilon_t \quad (3)$$

A co-integration test should be employed to ensure that a group of non-stationary series is co-integrated and the presence of long run relationship. This study employed a VAR (Vector Auto Regressive) based co-integration tests using the methodology developed by Johansen (1991, 1995). A VAR of order p can be written as follows.

$$y_t = A_1 + y_{t-1} + \cdots . + A_p y_{t-p} + Bx_t + \in_t \quad (4)$$

where y_t is a k-vector of non-stationary I(1) variables, x_t is a d-vector of deterministic variables, and $\in_t$ is a vector of innovations.

For the purpose of find out the short run relationship between variables and long run equilibrium of the variables, Error correction model was employed.

$$\Delta log Y_t = \alpha_t + \prod log\, Y_{t-1} + \sum_{i=1}^{p-1} \Phi_i^* \, \Delta log Y_{t-1} + \varepsilon_t \quad (5)$$

Where, $\Pi = \alpha\beta'$; where α is coefficient of error correction term, β'; (1×4) Vector of coinegrating coeffecints, Y_t =[PI_t, DD_t, EXD_t, $RGDP_t$]′ vector of endogenous variables, Y_{t-i} is the lagged value of variables and ε is the white noise error term.

4. Results and discussion

ADF and PP unit root tests were carried out to identify the order of relevant variables as a prerequisite for co-integration test. Results of ADF test is shown in following Table 1.

Table 1: Results of ADF unit root test

Variable	level		1st Difference	
	Intercept	Trend and Intercept	Intercept	Trend and Intercept
LPI	0.8761	0.1894	0.0066***	0.0314**
LRGDP	0.7016	0.6665	0.0003***	0.0017*
LEXD	0.9119	0.1711	0.0001***	0.0648*
LDD	0.9986	0.9801	0.0000***	0.0000***

Note: *, **, *** show significant at 10%, 5% and 1% level respectively

As per the results of ADF unit root test all variables in the model are not stationary at level, but stationary at their first difference ensuring that variables are integrated in order [1(1)]. After identifying the integrated order of variables, it is allowed to employ the Johansen co-integration test for the purpose of estimating the long run relationship between the dependent variable and independent variables. Before estimating the long run relationship, it is need to identify the optimal lag length of the model. Results of optimal lag length selection are given in following Table 2.

Table 2: Results of optimal lag length selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	11.04078	NA	7.86e-06	-0.402330	-0.224576	-0.340969
1	195.8982	316.8984	5.11e-10	-10.05132	-9.162553*	-9.744520
2	213.9400	26.80496	4.73e-10	-10.16800	-8.568211	-9.615752
3	244.4355	38.33721*	2.29e-10*	-10.99631*	-8.685510	-10.19862*

* indicates lag order selected by the criterion

As per the results, LR, FPE, AIC and HQ criteria suggest that optimal lag length as three though SC criterion suggests one lag length. Therefore, this study uses three lags as the optimal lag length. The result of Johansen Co-integration test is given in following Table 3.

Table 3: Result of Johansen Co-integration Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.552623	51.89584	47.85613	0.0199
At most 1	0.341607	22.93912	29.79707	0.2491
At most 2	0.195499	7.892789	15.49471	0.4769
At most 3	0.001709	0.061580	3.841466	0.8040

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Above result shows that Trace test statistic and Eigen value identified one co-integrating relation in the system of equation at 5% level of significance indicating the existence of long run relationship between variables. Maximum Eigen value also verifies the same result as Trace. (see Appendices Table A.1)

VECM can be estimated using this one co-integrating relation and the long run relationship between variables is shown as follows.

Eq. (6): Long run Relationship

$$LPI = -4.122341 + 0.969515LRGDP^{***} + 0.261528LEXD^{**} + 0.510648LDD^{***} \quad (6)$$
$$[3.09230] \qquad [1.97823] \qquad [4.85671]$$

Note: *, **, *** show significant at 10%, 5% and 1% level respectively.
t- statistics are given in parenthesis

Above results show that all dependent variables affect positively the dependent variable; private investment in long run since three independent variables are significant at 1% significant level (Real GDP and domestic debt) and 5% significant level (external debt) respectively. In line with the objective of the study, it is apparent that public debt including both domestic and external debt crowds in private investment in long run and real GDP has a positive impact on private investment. Presence of crowding in effect implies that government borrowing is not necessarily detrimental to the Sri Lankan economy in the case of private investment. This ambience mainly arises due to government investments utilizing the borrowed funds rather than putting a pressure on interest rate through borrowing. Nearly over last few decades the government has tended for more non-banking domestic debt than banking domestic debt and it has led to no pressure on interest rate and then no adverse effect on private investment. Meanwhile, external debt has supported to meet the implementation needs of large scale development projects that confer benefit in long run. A large number of development projects in Sri Lanka are driven with the help of external debt due to lack of its own financial resources. However, development of physical and social infrastructure in this process is a motivation for private sector. This result is indirectly consistent with phenomenon where Keynesian Economists explain about crowding in effect of government investment on private investment (Saeed *et. al,* 2006). Along this crowding in effect, real GDP has a positive impact on private investment implying that the GDP growth provides further expansion in private investment.

Table 4: Speed of Adjustment

Error Correction:	D(LPI)	D(LRGDP)	D(LNEXD)	D(LDD)
CointEq1	-0.437975	0.099045	-0.103092	0.139020
	(0.29771)	(0.11067)	(0.23121)	(0.11537)
	[-1.47113]	[0.89496]	[-0.44588]	[1.20495]

Coefficients of speed of adjustment explain how above model is adjusted towards long run equilibrium after external shocks. As per the results (see Table 4), it denotes that the error correction term is negative, but not significant at any significant level implying any external shocks do not have impact on the long run equilibrium significantly. In the line with this result, the independent variables are positive except EXD variable but, not significant at any significant level. Meanwhile, the results show that there are no any short run relationships between variables implying no instant responses of the private investment to the variation of any kind of variables in the model. (See Appendices Table B.1)

5. Conclusion and policy implications

This study aims to examine the crowding in/out effect of public debt comprising both domestic and external using annual data covering the period 1978-2015. Unit root test confirmed that all variables are stationary at their first difference indicating variables are integrated in order one. As per the lag length criteria, the study uses three lags as optimal lag length. Johansen co-integration test verified the existence of long run relationship between variables. Results of VECM showed the positive long run relationship between public debt and private investment indicating the existence of crowding in effect of public debt on private investment. This result denotes that an efficient and productive way of utilizing public debt would facilitate private sector and spurring investment. Under the theoretical perspective, these results can be justified using the relevance of Keynesian theory on crowding in effect in explaining the relationship between public debt and private investment in Sri Lanka. This outcome is resulted by utilizing public debt in massive infrastructure development projects such as road network, high ways and electricity projects that have paved the way for motivation and expansion in private investment. However, this effect is not valid in short run, because private sector would not be able to response and adjust to the government activities in the short run.

Furthermore, borrowing beyond the sustainable level of public debt will have a detrimental effect on economic growth. Therefore, less dependency on debt should be focused on through fostering the economy to expand investment opportunities for the private sector.

References

Abdullahi, Muhammad Mustapa, Bakar, Nor Aznin Bt Abu and Hassan, Sallahuddin B. (2016). Debt Overhang versus Crowding out Effects: Understanding the Impact of External Debt on Capital Formation in Theory. International Journal of Economics and Financial Issues, 6(1), 271-278.

Abilene, Janice, Patenio, S. and Tan-Cruz, Agustina (2007). Economic Growth and External Debt Servicing of Philippines: 1981-2005. In Proceedings of 10th National Convention on Statistics (NCS), 1-2 October.

Adegbite, Esther O. Ayadi, Folorunso S. and Ayadi, Felix O. (2008). The Impact of Nigeria's External Debt on Economic Development. International Journal of Emerging Markets, 3(3), 285-301.

Akomolafe, Kebinde John. Bosede, Olanike. Emmanuel, Oni and Mark, Achukwu. (2015). Public Debt and Private Investment in Nigeria. American Journal of Economics, 5(5), 501-507.

Akram, Naeem. (2013). Empirical Examination of Debt and Growth Nexus in South Asian Countries. Asia-Pacific Develpoment Journal, 20 (2), 29-48.

Apere, ThankGod O. (2014). The Impact of Public Debt on Private Investment in Nigeria: Evidence from Nonlinear Model. International Journal of Research in Social Sciences, 4(2), 130-138.

Bai, Chong-En, Hsieh, Chang-Tai and Song, Z.M. (2016). The Long Shadow of a Fiscal Expansion. The National Bureau of Economic Research, Working Paper No. 22801, 1-43.

Carrasco, Marien. (1998). Crowding-out and Government Spending. University Avenue Undergraduate Journal of Economics, 40(4), 1-9.

Central Bank of Sri Lanka. (1978 -2015). Annual Reports. Colombo: Central Bank of Sri Lanka.

Chaudhary, M.A. and Anwar, Sabahat. (2000). Debt, Dependency and Economic Growth in South Asia. The Pakistan Development Review, 39(4), 551-570.

Dayaratna-Banda, O.G. and Priyadarshanee, A.A.S. (2014). Sustainability of Government Debt in Sri Lanka. International Journal of Business and Social Research, 4(7), 100 - 108.

Deyshappriya, Ravindra N.P. (2012). Debt and Fiscal Sustainability in Sri Lanka. International Journal of Scientific and Research Publications, 2(3), 1-8.

Fonseka, A.T. and Ranasinghe, S.S. (2007). Sustainability of Sri Lanka's Public Debt. Sri Lankan Journal of Management, 12(3), 185 - 212.

Hussain, M. Ershad, Haque, Mahfuzul and Igwike, Richard S. (2015). Relationship between Economic Growth and Debt: An Empirical Analysis for Sub-Saharan Africa. Journal of Economics and Political Economy, 2(2), 262-276.

Hyder, Kalim (2001). Crowding-out Hypothesis in a Vector Error Correlation Framework: A Case Study of Pakistan. The Pakistan Development Review, 40(4), 663-650.

Khan, Rana Ejaz Ali and Gill, Abid Rashid (2009). Crowding Out Effect of Public Borrowing: A Case of Pakistan. In Proceedings of 8th National Research Conference on Management and Computer Sciences, 29 January 2009.

King'wara, Robert (2014). The Impact of Domestic Public Debt on Private Investment in Kenya. Developing Country Studies, 4(22), 88-96.

Kirchner, Markus and Wijnbergen, Swedervan (2016). Fiscal deficits, Financial Fragility and the Effectiveness of Government Policies. Journal of Monetary Economics, 80, 51-68.

Koeda, Junko (2008). A Debt Overhang Model for Low-Income Countries. Staff Papers (International Monetary Fund), 55(4), 654-678.

Krugman, P. R. (1988). Financing versus Forgiving a Debt Overhang. Journal of Development Economics, 29 (3), 253-268.

Kumara, Hemantha and Cooray, N.S. (2013). Public Debt and Economic Growth in Sri Lanka: Is There Any Threshold Level for Public Debt. Economics and Management Series, Working Paper EMS_2013_22, 1-21.

Majumder, Alaudduin Md. (2007). Does Public Borrowing Crowd-out Private Investment?: The Bangladesh Evidence. Policy Analysis Unit (PAU). Working Paper Series: WP 0708, 2-26.

Rathnasiri, R.A. and Wijesinghe, T.C. (2012). Government Fiscal Operation and Financial Deepening in Sri Lanka. International Journal of Multi-disciplinary Management Studies, 2(2), 1-17

Ray, David and Lng, Lili Yan. (2016). Addressing Indonesia's Infrastructure Deficit. Bulletin of Indonesian Economic Studies, 52 (1), 1-25.

Reuss, Alejanoro (2009). Fiscal Policy and Crowding out: The General Theory and the Current Crisis. A Primer on Keynes' Economics. Wheaton College. Retrieved from http://dollarsandsense.org/archives/2009/0509reusskeynespartI.html

Saeed, Noman, Hyder, Kalim, Ali, Asghar and Ahamad, Eatzaz (2006). The Impact of Pubic Investment on Private Investment: A Disaggregated Analysis. The Pakistan Development Review, 45(4), 639-663.

Sen, Huseyin and Kaya, Ayse (2013). Crowding-out or Crowding-in? Analyzing the Effects of Government Spending on Private Investment in Turkey. Panoeconomics, 631-651. DOI: 10.2298/PAN1406631 S.

Shah, Mahmud Hasan and Pervin, Shahida. (2012). External Public Debt and Economic Growth: Empirical Evidence from Bangladesh, 1974-2010. Academic Research International, 3(2), 1-8.

Slimani, Salma. (2016). Threshold Effects of Fiscal Policy on Economic Activity in Developing Countries. International Journal of Business and Social Research, 6(3), 20-37.

Appendices

A.

Table A.1: Result of Johansen Co-integration Test (Maximum Eigenvalue)

Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.552623	28.95672	27.58434	0.0332
At most 1	0.341607	15.04633	21.13162	0.2857
At most 2	0.195499	7.831209	14.26460	0.3961
At most 3	0.001709	0.061580	3.841466	0.8040

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

B.

Table B.1: Short-run Relationship

	D(LPI)	D(LRGDP)	D(LNEXD)	D(LDD)
D(LPI(-1))	0.223269	0.005326	-0.041501	-0.121991
	(0.29500)	(0.10966)	(0.22910)	(0.11432)
	[0.75684]	[0.04857]	[-0.18114]	[-1.06707]
D(LPI(-2))	0.545590	0.045184	0.079224	0.348515
	(0.19784)	(0.07354)	(0.15365)	(0.07667)
	[2.75769]	[0.61438]	[0.51562]	[4.54563]
D(LPI(-3))	-0.096337	0.006797	0.182957	0.018785
	(0.28718)	(0.10676)	(0.22303)	(0.11129)
	[-0.33545]	[0.06367]	[0.82031]	[0.16879]
D(LRGDP(-1))	0.042090	-0.677408	-0.109227	-0.764806
	(0.89377)	(0.33224)	(0.69412)	(0.34636)
	[0.04709]	[-2.03889]	[-0.15736]	[-2.20810]
D(LRGDP(-2))	0.159259	-0.109466	0.120394	-1.295486
	(1.15514)	(0.42940)	(0.89711)	(0.44765)
	[0.13787]	[-0.25493]	[0.13420]	[-2.89395]
D(LRGDP(-3))	0.613591	0.035706	-0.294373	-0.114880
	(0.98923)	(0.36773)	(0.76826)	(0.38336)
	[0.62027]	[0.09710]	[-0.38317]	[-0.29967]
D(LNEXD(-1))	-0.092623	0.149593	-0.147296	-0.165339
	(0.37191)	(0.13825)	(0.28883)	(0.14413)
	[-0.24905]	[1.08205]	[-0.50997]	[-1.14718]

D(LNEXD(-2))	-0.691420	-0.076138	-0.180274	0.081796
	(0.38974)	(0.14488)	(0.30268)	(0.15104)
	[-1.77405]	[-0.52553]	[-0.59559]	[0.54156]
D(LNEXD(-3))	-0.402234	0.036587	0.167875	-0.219523
	(0.38440)	(0.14289)	(0.29853)	(0.14897)
	[-1.04639]	[0.25604]	[0.56233]	[-1.47363]
D(LDD(-1))	-0.596195	-0.196591	-0.217057	-0.235083
	(0.46904)	(0.17436)	(0.36427)	(0.18177)
	[-1.27110]	[-1.12752]	[-0.59588]	[-1.29332]
D(LDD(-2))	0.400945	0.008719	-0.120056	-0.388802
	(0.38483)	(0.14305)	(0.29886)	(0.14913)
	[1.04189]	[0.06095]	[-0.40171]	[-2.60711]
D(LDD(-3))	0.050792	-0.041073	0.065723	-0.162989
	(0.30929)	(0.11497)	(0.24020)	(0.11986)
	[0.16422]	[-0.35724]	[0.27362]	[-1.35983]
C	0.184971	0.107490	0.171393	0.378626
	(0.18895)	(0.07024)	(0.14674)	(0.07322)
	[0.97894]	[1.53035]	[1.16799]	[5.17081]