EXTERNAL DEBT AND INFRASTRUCTURAL DEVELOPMENTS IN EMERGING ECONOMIES: EVIDENCE FROM NIGERIA, 1979-2019.

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ABSTRACT

The Study examined External Debt and Infrastructural Developments in Emerging economies: Evidence from Nigeria, 1979 – 2019. The objective is to examine whether there is a nexus between external debt and infrastructural developments by evaluating the relationship between both variables using available evidences from Nigeria. The balance-growth theory was employed and the sample period covered 40 years with data obtained from World Bank Group online database. The study used Robust least square regression, Autogressive Distributed lag (ARDL), and the Error Correction Model to test the variables at the 0.05 significance level. The results indicates that external debt has positive and significant effect on the dependent variable in the short-run, but shows no significant correlation with infrastructural developments proxy by capital investments in the long-run and negatively insignificant nexus with real GDP. This study concludes that while foreign debt has significant relationship with the dependent variable in the short-run, it however, has insignificant correlation with infrastructural development in the long-run; and recommends that external borrowing contracts should be based on sound credit appraisals, to finance self-liquidating priority projects.

Key words: External Debts, Infrastructure, Capital Investments, Development, Debt servicing, Nigeria.
JEL Classification: H4, H5, H6, H8

1.0   INTRODUCTION

Debts are means of financing investments (corporate entities) and national capital projects (sovereign nations). Sovereign nations, both developed and developing, through their governments borrow to finance budget deficits and specially carved out productive projects. The outcome of these debt-oriented capital expenditures are expected to impact national economic output.

However, several arguments have been adduced by different social scientists either supporting the deployment of debt proceeds to finance infrastructural developments, that such, impacts economic growth (Ijirshar, Fefa and Godoo, 2016; Zaman and Arslan, 2014; Ekperiware and Oladeji, 2012) while some others argued that debt-induced infrastructural developments do not exert positive impact on national economic output. (Soludo, 2004; Mojekwu and Ogege, 2012; Essien, Ngozi, Michael, and Ogochukwu, 2016; Isibor, Babajide, Akinjare, Oladeji, and Osuma, 2018). This lack of consensus on subject, has necessitated interest to further study the correlation between external debt, infrastructural development and national economic output in emerging economies.

The country as one of the emerging world economies that is highly indebted to lending institutions and nations, coupled with the discovery of oil in the Niger-Delta in 1967 made government to abandon hitherto sustainable sectors of the economy- tourism, agriculture, maritime, mining and manufacturing sectors. Consequently, government's total reliance on revenues from oil sales to finance projects and programs turned the economy to be mono-lithic. The mono product culture of the country exposes it to oil price shocks and consequences of pandemic (currently, the covid-19 has dramatically altered the economic equations and governments' plans all over the world). Elom-obed, *et al.* (2017) argued that, the cause of low standard of living income, imbalances in trade, deficits, declining output and galloping unemployment rate is the single product feature of the economy. They also contend that, proceeds from oil sales in the volatile international oil market were not enough to meet the macro-economic challenges of the country. Ideally, no nation in the world is self-sufficient to sponsoring her programs without borrowing. Therefore, to bridge this revenue gap recourse is garnered to secure internal or external loans.

Consequences of mono-product economy are several. These economic woes are abounding due to the replication of economic conundrum of the Dutch-Disease gracefully employed by the Nigerian government for the past 60 years. Petrodollars were grossly mismanaged and openly embezzled to the detriment of the people's wellbeing and economy. As asserted by Elom-Obed, *et al* (2017), fiscal indiscipline, political sentiments, aristocracy and mismanagement of oil revenues and public debts resulted to this poor and porous state of the economy.

Previous studies had considered the outcome of State debt on national output with related findings (Essien, Ngozi, Michael, and Ogochukwu, 2016; Isibor, Babjide, Akinjare, Oladeji, and Osuma, 2018; Elom-Obed, Odo, Elom-Obed, and Anoke, 2017; Senibi,

Oduntan, Uzoma, Senibi, and Akinde, 2016). Economic growth is ascertained by several indices such as production index of the nation, per capita income, level of infrastructure, standard of living, foreign direct investments (FDI), government stability, and rate of inflation, level of unemployment, money supply, level of consumption, exports and imports level etc. This amounts to a broad spectrum of macro-economic indices that affect the outcome of government debt on economic growth. It therefore stands that; combination of these indicators must be evaluated at certain period to present the economic growth picture of any country. Such a laborious and not specific study, constrained with data may not be feasible. More so, empirical studies reviewed did not contemplate examining the specific and statistical nexus of external debt to infrastructural development in developing countries. It is this identified gap that the study intends to bridge.

The purpose of this investigation is to ascertain Nigeria's external debt impact on infrastructural development from 1979-2019. This will help us ascertain in concrete terms the impact of the borrowed funds on infrastructure for the period since debt (loan) is usually tied to capital investments. One hypothesis would be addressed in this study; that, there is no significant nexus of external debt to infrastructural developments in Nigeria. The study no doubt, will assist policy makers to evolve functional plan for utilizing external loans according to purpose(s).

This paper is organized into five sections. Sequel to introduction is review of literature in section two while section three undertakes explanations on materials and methods for the study. Section four considers results and discussion while conclusion and recommendations are contained in the last section.

2.0   REVIEW OF RELATED LITERATURE

The literature review considers the key concepts relating to external debts and infrastructural developments in the study area, the supporting theory and a review of key empirical investigations on subject.

2.1   Conceptual Studies

Debt is broadly classified into two, namely, external and internal debt. It may also be categorized into foreign and domestic debt which are rightly the same. Government debt is also considered as public debt being debt incurred to finance projects for public good. The recurrent problem of limited resources to sponsor infrastructure, expansionary policies, and programs that stimulate growth and development leads to borrowing from both external and/or internal sources. Obviously, infrastructural projects are giant stimuli to economic growth (GDP) of a country. Developed nations are so categorized based on their investments in capital and productive projects and programs that encourage economic activities in their domains. In similar vein and in support of Keynesian's postulation on borrowing, we contend that efficient spending of external loans, external reserves and minimizing amount for

servicing debts (repayment done in time) will result to improvement in infrastructures in developing countries.

External debt is therefore the unpaid loan to lending nations and monetary institutions like as USA, UK, China, IMF, World Bank, AFDB etc. It represents the unpaid portion of foreign resources acquired for sponsoring development projects and meet balance of payment deficits which are not repaid as they fall due (Senibi *et al*, 2016 and Ajibola, Udoette, Omotosho, and Rabia, 2015). However, the definition of external debt according to Senibi *et al,* (2016) with the phrase 'as they fall due' may not be appropriate because debt occurred the day/or date the loan contract is endorsed by the parties. A contract whereby a given sum of fund becomes due to any person, institution or nation or its agencies and is to be paid but remains inaction is a contract of debt. External debt, being a contract between one country and another or foreign financial institutions is a special contract of debt (Black law Dictionary, 2009).

Compensations for lent money known as interests are charges on contracted loans. The interest rate is most times determined by the lending institutions, sometimes influenced by the bargaining powers of contracting parties. In circumstances where the borrower fails to honor a loan agreement as at when due, it may amount to debt servicing which is additional burden to the borrowing nation. At times, the amount for servicing debts may erode the benefits of the capital borrowed, if not utilized in productive ventures/ or projects which yield high returns. Debt,

whether foreign or domestic, demands for security to facilitate the release of agreed funds.

2.2 Theoretical Studies

The study is motivated by the theory of balanced growth which is premised on even allocation of productive resources to all sectors of the economy. It entails judicious allocation of productive resources to different sectors according to dynamics in demand. The import of borrowing is to boost economic activities which in turn increase growth and development of a nation. Nurse (1959, as cited in Elom- Obed, *et al*, 2017) propounded that sharing of increase in productive resources should be to all economic based on demand. Economic resources (capital and technology) should be utilized by different industries in an economy to promote efficiency and enlarged market size. The proponent argued that investments in diverse industries enhance vertical and horizontal integration, promote division of labour and technical skills.

It was further contended that underdeveloped countries were incapable of galvanizing the advantages from external economies because of the huge capital required for economic expansion. Equally, private enterprises are not financially buoyant to establish in full scale. In order to appropriate these advantages from growth, government must borrow to effect stimuli of certain incentives to the economy. For instance, investments in agriculture will provide raw materials for the industries and investments in critical infrastructure (roads, electricity, railways, security, healthcare facilities, education etc.)

have overwhelming impact on productive activities, ease of transporting goods and services, markets expansion, employment generation, peace and security, enhanced living standard, etc.

Strong institutions are the bedrock for achieving the ideals of the theory while weak institutions and policies had been recognized as means of incubating corruption, conduit pipes for wastages and overall damage to the economy. These are debilitating factors to emerging economy's growth which proponents of profligacy thesis were worried about. The advocacy for accountable, transparent reforms and strong institutions are veritable machineries tor economic rejuvenation and transformation (Isibor, *et al*, 2018). We cannot borrow for every purpose as enunciated by Keynesian theory on public debt. Keynes assumed that, when government borrows for all purposes, it would spur up efficient demand, employment and output. However, Classical school of thought advocated for productive investments that would yield high returns for the repayment of debt (Elom-Obed, *et al*, 2017). When debt is not repaid as at when and due, it amounts to debt servicing that drains government external reserves being a security cover.

2.3   **Empirical Studies**

Several studies have been carried out on subject but with conflicting outcomes, and some of these studies include;
Elom-Obed, Odo, Elom-Obed, and Anoke, (2017) examined government debt effect on Nigeria's national output between 1980 to 2015. The research which used VECM (Vector Error Correlation Model) statistical data analysis method, employed variables such as RGDP, foreign borrowings, and local private savings. The result of the research revealed that government borrowings had negatively significant impacts on national output growth and domestic debt had significant positive link to national output growth for same period. The result further revealed a Uni-directional causality between total debt comprising of foreign borrowings and local debts, with Nigeria RGDP. This study suggests that government should curtail external debt and spend it judiciously on productive projects.

Essien, Ngozi, Michael, and Ogochukwu (2016) through empirical investigation of the macro-economic variables x-rayed the outcome of government debt in Nigeria using selected econometric tools such as Granger-causality, impulse response, VAR, and variance decomposition of many innovations to measure the outcome. The study discovered how changes to foreign debt can create shocks to the Central bank lending rate for lagged period. Results from this paper suggests that authorities should sustain borrowing from the long-term market.

Isibor, Babjide, Akinjare, Oladeji, and Osuma, (2018) in their work on the outcome of government debt on Nigeria's national output between 1982-2017 using the two-stage least square regression. Internal and external debts and attendant lags were regressed on GDP in the first stage. It discovered that while external debt impacted negatively on the economy, internal debt had a positive impact. In the next equation, GDP, total savings deposits in DMBs and capital

expenditure were regressed on local debt and evidence demonstrated that all variables were connected to domestic debt. The study suggested that the authorities should minimize borrowing from external sources and also fight against corruption.

In 2012, Ekperiware and Oladeji researched on how foreign debt relief affects Nigeria national output between 1975-2005 using quarterly time series regression method for variables such as external debt, real GDP and external debt service cost. Application of Chow-test to the regression outcome, resulted to structural break among the variables. The work further established that external debt relief was a necessary panacea for developing and debt-ridden countries because it provided resources for economic growth.

Kaluluma (cited in Esssien *et al*, 2016) used a panel research to examine how public debt interplay with interest for the economies of Canada, United Kingdom, the United States of America and Germany using the Johansen error-correction model (ECM) statistical technique. Interest rate, exchange rate, domestic asset stock and the real GDP, were the variables used and the result showed no positive outcome on the variables.

In the work of Faraji and Makame of 2013, on the effect of external loans on productivity rate in the Tanzanian economy from 1990 to 2010, employing time series tools, documented a positively significant relationship between the variables. This research affirmed that external loans assists emerging economies in attaining their development objectives.

Godfrey and Mutuku (2013) study in Kenya, verified the connection existing with internal borrowing and national output between 2000 – 2010. The findings using ADF and other statistical methods, revealed that increase in the internal borrowing was influenced by national output.

Zaman and Arslan (2014) determined the purpose of external loans in economic growth of Pakistan. The study employed Distributive Statistics and OLS Estimation Technique on time series data for 39 years (1972-2010). Findings revealed that gross capital formation and foreign debt stock showed positively significant effect on Pakistan GDP while gross domestic savings did not have significant impact on GDP.

Ayadi and Ayadi (2008) had a comparative study on external debt and output growth in two countries, namely South Africa and Nigeria between 1980 – 2007. The research used Least Square estimation to test the annual series variables adopted. Results indicated external debt and external debt servicing showed negative correlations on the selected economies.

Ijirshar, Fefa and Godoo (2016) studied the connection holding external debt with economic growth in Nigeria from 1981-2014. They employed Descriptive and Econometric tools to analyze the time series data. It was observed that external debt was significantly related to GDP in the long run while external debt servicing had negatively impacted output.

From the foregoing reviewed literature, the following gaps were identified which this

study intends to fill; Specific correlation of external debt with infrastructural development in emerging economies, indicating the period of assessment from 1979-2019 amounting to four decades.

3.0   MATERIALS AND METHODS

The study engaged secondary key data sourced from the World Bank Group between 1979 to 2019. The variables considered include – Real Gross Domestic Product (RGDP), External Debts (EXDT), Capital Investments (CAIV), Inflation rate (INFR) and Total Debt Service cost (TDS).

3.1   Model Specifications

This work will be approached using the perspectives of Elom-Obed, *et al*, 2017 with moderate modifications, considering the variables and econometric methods employed. The primary model used External Debts, Domestic Debts, real RGDP and investments savings as variables while this study will use economic growth (RGDP), External Debts (EXDT), Capital investments (CAIV), Inflation rate (INFR) and Total debt Service costs (TDS) and represented in equation (1) below;

1. $CAIV = \beta 0 + \beta_1 EXDT + \beta_2 RGDP + \beta 3 INFR + \beta 4 TDS$... Equation 1 (model 1)

Where, CAIV, EXDT, RGDP, INFR, TDS are as define in above paragraph.

TDS = Total Debt Service ratio to Gross National Income (GNI) %

β_0 - β_4 = Parameters

Apiriori expectation $= 0 < EXDT > 0$, positive and significant

Definitions of Terms:

i. TDS – Total debt service (%GNI) is used to measure the main facility amount repayments with interest paid in agreed denomination such as in cash or goods/services for long-term debt, while interest accruals for short-term debt and repayments are made to the monetary fund.

ii. EXDT – External debt is the proportion of a nation's loan profile that is borrowed from external fund lenders and institutions such as international financial institutions. This is measured as percentage ratio of GDP while in other instances could be expressed as percentage of gross national income.

iii. CAIV – Capital Investment is the expenditure of funds by a company, institution or country in the establishment of long-term revenue producing assets that are public goods in nature. Expressed as %GDP, consists of investments in additions to the fixed assets of a country in addition to stock level net changes. Tangible fixed assets will cover land acquisitions with upgrades, plants, equipment and machines, social infrastructure provisions such as schools, railways, road, and hospital constructions, national buildings and properties.

iv. RGDP – This is usually with inflation-adjusted Real gross domestic product, is the rate of growth of products or services manufactured in a country in a given year expressed as percentage.

v. INFR – Inflation rate is the general increase in price level of unit products or services in a defined period.

4.0 DATA AND ANALYSIS

This section considers the treatment of selected variables as specified in section 3.0 using various diagnostic tests methods. This is preceded by the conduct of the relevant hypothesis testing and discussions of the outcome.

4.1 Diagnostic Tests

The diagnostic tests assists to check data and model suitability for the research work and adopts appropriate refinery process to make it useable for our research work and reliable output.

4.1.1 Explanatory Statistics

Table 1 – Explanatory Statistics for External Debt with Infrastructural Development

	CAIV	EXDT	INFR	RGDP	TDS
Mean	39.04244	61.54439	18.75585	3.263805	2.637146
Median	36.63000	51.16000	12.22000	4.210000	1.880000
Maximum	94.23000	228.3700	72.84000	15.33000	6.520000
Minimum	14.90000	4.130000	5.380000	-13.13000	0.100000
Std. Dev.	22.42058	59.14040	16.72602	5.361210	2.090490
Skewness	1.077321	0.939632	1.862895	-0.928802	0.488567
Kurtosis	3.424663	3.286470	5.312534	4.839207	1.830661
arque-Bera	8.238978	6.173401	32.85009	11.67369	3.966999
Probability	0.016253	0.045652	0.000000	0.002918	0.137587

Sum	1600.740	2523.320	768.9900	133.8160	108.1230
Sum Sq. Dev.	20107.30	139903.5	11190.39	1149.703	174.8059
Observations	41	41	41	41	41

Source: Author's E-view's 10 computation

The table 1 indicates that over 83.3% of the variables show an average kurtosis greater than 3, which indicates a platykurtic features while 16.7% are below 3, indicative of a leptokurtic character. Most of the variables show a significant Jarque-Bera statistics of p-values below the 5% significant level.

4.1.2 Stationarity Tests

This tests indicates that the data in the series are stationary at a given level with significant p-value.

Table 2 – Unit root Tests

Fluid	Stat (ADF)	Crit. value @ 5%	P-value	integration
CAIV	-5.4268	-3.5330	0.0004	(1)
EXDT	-6.0668	-3.5298	0.0001	(1)
INFR	-6.2332	-3.5331	0.0000	(1)
RGDP	-9.1213	-3.5298	0.0000	(1)
TDS	-6.3098	-3.5298	0.0000	(1)

Source: Author's E-view's 10 computation

all the variables (fluid) have probabilities that are significantly integrated at first level at the 5% chosen significance level.

4.1.3 Heteroscedasticity Tests

Table 3 – Heteroskedastic test Result using BPG

Heteroskedastic Test: Breusch-Pagan-Godfrey			
F-statistic	1.896329	Prob. F(4,24)	0.1438
Obs*R-squared	6.964445	Prob. Chi-Square(4)	0.1378

Scaled explained SS	8.916523	Prob. Chi-Square(4)	0.0632

Source: Author's E-view 10 Computation

Table 3 indicates no heteroscedasticity in the model since p-values are insignificant and greater than the 0.05 significance level.

4.1.4 Serial Correlation Tests

Table 4 – Autocorrelation Tests

BG Serial Correlation LM Test:			
F-statistic	2.251628	Prob. F(2,27)	0.1246
Obs*R-squared	5.003101	Prob. Chi-Square(2)	0.0820

Source: E-view 10 Computation

The serial correlation result indicates no autocorrelation in the series and in the model under consideration with p-values greater that the 0.05 chosen significance level.

4.1.5 Ramsey Reset Tests

Table 5 – Ramsey Reset Result

Ramsey RESET Test			
Specification: CAIV C EXDT(3) INFR(8) RGDP(-1) TDS(-4)			
Omitted Variables: S^2 of fitted values			
	Value	df	Probability
t-statistic	0.432702	23	0.6693
F-statistic	0.187231	(1, 23)	0.6693
Likelihood ratio	0.235118	1	0.6278

Source: Author's E-views 10 Computation.
The Ramsey reset tests in table 5 indicates that t and F-statistics are both higher than 5% chosen significance level and hence, the model is well fitted for the relationship and linear.

4.2 Hypothesis Testing

One hypothesis will be tested in this section as shown below;

4.2.1 Hypothesis Testing

H_0: No significant relationship between external debt and Nigeria infrastructural development

H_1: Significant relationship between external debt and Nigeria infrastructural development

The above hypothesis will be processed employing several econometric techniques such as the robust least square regression, ARDL and Error Correction Model.

Table 6 –Robust Least Square Regression Result 1

Dependent Variable: CAIV				
Method: Robust Least Squares				
Date: 11/01/21 Time: 19:47				
Sample: 1979 2019				
Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	17.51344	1.532105	11.43096	0.0000
EXDT	0.189972	0.024372	7.794817	0.0000
INFR	-0.209372	0.064248	-3.258794	0.0011
RGDP	0.092832	0.154018	0.602734	0.5467
TDS	2.038813	0.608939	3.348141	0.0008

Source: Author's Eview 10 Computations (See appendix 2 for details).

The result in table 6 for RLSR indicates a positive and significant correlation between external debt (EXDT) and capital investment (CAIV) with p-value of 0.0000 and a coefficient of 0.18997 between 1979 to 2019, a measure of positive infrastructural development in the short-run. Inflation rate and Total Debt Servicing Cost remain significant (serving as test variables). It is important to note that the R^2 and the adjusted RW of 58.27% and 90.43% respectively

shows that the variables in the model produces a perfect goodness fit and has capacity to take on more variables.

Table 7 – Autoregressive Distributed Lag Model 1

Dependent Variable: CAIV			
Method: ARDL: Sample 1979 - 2019			
Date: 11/01/21 Time: 19:48			
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
CAIV(-1)	1.069204	0.171828	6.222514	0.0000
CAIV(-2)	-0.603746	0.220565	-2.737267	0.0112
CAIV(-3)	0.546562	0.181972	3.003552	0.0060
CAIV(-4)	-0.240202	0.125498	-1.913985	0.0671
EXDT	0.020548	0.020496	1.002517	0.3257
INFR	0.016986	0.053046	0.320207	0.7515
RGDP	-0.310799	0.160015	-1.942304	0.0634
RGDP(-1)	0.586972	0.179984	3.261255	0.0032
RGDP(-2)	-0.088682	0.160333	-0.553114	0.5851
RGDP(-3)	-0.281150	0.152294	-1.846105	0.0768
TDS	0.414249	0.479499	0.863922	0.3958
C	4.146540	2.180268	1.901849	0.0688

Source: Author's Eview 10 Computations (See appendix 3 for details).

The ARDL model shows that at a p-value of 0.3257, external debt does not co-integrate with capital investment. Similarly, the control variables indicate an insignificant relationship with capital investment.

Table 8: Error Correction Model Result 1

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECT(-1)	-0.121692	0.280172	-0.434347	0.6671

Source: Author's Eview 10 Computations (See appendix 4 for details)

Similarly, the ARDL position is reinforced by the ECM result of a negative but insignificant effect of the external debt on capital investments (proxy for infrastructural development) in the long-run. This indicates that there is no long-run convergence between these variables of interest.

Decision rule: The results from table 6, 7 and 8 indicates a positively significant relationship only in the short-run but insignificant in the long-run period at the 0.05 significance level.

Hence, H_0 is rejected in the short-run but accepted in the long-run. While H_1 is accepted in the short-run but rejected in the long-run. We can conclusively, say that there is an insignificant relationship between Nigeria external debt and capital investments in the long-run (Proxy for infrastructural developments in Nigeria).

4.3   Discussions of Findings

This study investigates external debt and infrastructural developments in emerging economies using evidence from Nigeria between 1979 and 2019. The hypothesis under study indicates that there is insignificant connection of external debt to infrastructural developments proxy by capital investments, which was tested after appropriate diagnostics of the series data and application of relevant econometric tools.

The main tests revealed an insignificantly positive relationship between capital investments proxy for infrastructural developments and external debts of Nigeria (p-value of 0.3257), while RGDP showed a negative and insignificant (p-value of 0.0634) outcome with capital investments and also, no significant relationship with total debt servicing costs for the long-run period, hence, no co-integration. However, short-run was

replete with positively significant correlation between capital investments and external debt (p-value was 0.0000) for the significance level 0.05. While the outcome of this investigation is in consonance with the outcome of Mojekwu and Ogege, (2012); Essien, Ngozi, Michael, and Ogochukwu, (2016); Isibor, Babajide, Akinjare, Oladeji, and Osuma, (2018) of a negative and insignificant relationship between EXDT and CAIV.

Policy implications of the above results is that a 1% growth in external debt of an emerging nation such as Nigeria in the short-run, will result to a significant rise of 0.1900% in the country's infrastructural development while in the long-run, such growth becomes insignificant.

5.0 CONCLUSION

The study investigated the nexus for external debt and infrastructural developments in emerging economies and documents a positively significant relationship in the short-run but insignificant in the long-run. We can thus, convincingly conclude that the relationship though, strong and significant in the short-run, is however, insignificant in the long-run.

Based on the foregoing, we recommend that;

1. Emerging economies should contract well-appraised external debts only to finance Self-liquidating, priority projects, in their countries such as road constructions, railway constructions, industrial complex developments, refinery construction, power generation, etc.
2. Emerging Economy nations should evolve consistent and prudent debt management strategies needed to curb unpleasant rising debt servicing costs.

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Appendices

1. Table showing selected sample variables

Year	EXDT	RGDP	EXRS	TDS	INFR	CAIV
1979	13.30	6.759	94.48	0.83	13.30	92.36
1980	14.63	4.21	119.04	1.88	9.97	94.23
1981	19.23	-13.13	36.42	1.10	20.81	89.38
1982	23.83	-6.80	16.06	1.48	7.70	85.93
1983	50.54	-10.92	7.12	2.66	23.21	75.75
1984	64.16	-1.12	9.41	5.59	17.82	58.95
1985	66.98	5.91	10.14	6.09	7.44	46.39
1986	115.12	0.06	6.08	3.84	5.72	54.95
1987	133.77	3.20	5.16	2.20	11.29	49.99
1988	130.15	7.33	3.15	4.50	54.51	43.64
1989	136.02	1.92	6.78	5.05	50.47	52.49
1990	120.05	11.78	12.34	6.52	7.36	53.19
1991	134.45	0.36	13.95	6.31	13.01	48.41
1992	110.12	4.63	4.12	5.38	44.59	43.78
1993	228.37	-2.04	5.34	5.87	57.17	44.49
1994	210.33	-1.82	4.98	5.95	57.03	42.08
1995	129.51	-0.07	5.01	4.38	72.84	37.24
1996	95.90	4.20	13.78	4.56	29.27	36.63
1997	84.76	2.94	27.33	2.71	8.53	38.48
1998	103.89	2.58	24.08	2.57	10.00	40.61
1999	84.59	0.58	19.42	1.85	6.62	38.34
2000	80.46	5.02	31.20	2.93	6.93	34.11
2001	78.46	5.92	33.89	3.61	18.87	30.93
2002	59.94	15.33	23.81	1.65	12.88	27.58
2003	61.19	7.35	20.20	1.68	14.03	29.39
2004	51.16	9.25	43.25	1.35	15.00	27.12
2005	26.05	6.44	111.17	5.41	17.86	26.19
2006	6.83	6.06	444.36	2.90	8.24	27.87
2007	7.86	6.59	427.41	0.38	5.38	21.24
2008	6.81	6.76	408.25	0.21	11.58	19.90
2009	10.29	8.04	285.47	0.27	11.54	22.05
2010	4.43	8.01	231.75	0.37	13.72	17.56
2011	4.54	5.31	205.31	0.14	10.84	16.36
2012	4.13	4.23	262.30	0.31	12.22	14.96
2013	4.32	6.67	218.76	0.10	8.48	14.90
2014	4.51	6.31	151.47	0.83	8.06	15.80
2015	5.97	2.65	108.26	0.34	9.01	15.49
2016	7.75	-1.62	96.40	0.63	15.68	15.37

2017	10.92	0.806	79.49	0.98	16.52	15.47
2018	12.20	1.923	22.06	1.53	12.09	19.81
2019	54.83	2.208	35.4	1.183	11.40	21.33

Source: World Bank, International Debt Statistics, 2020

2. Robust Least Square Regression Output 1

Dependent Variable: CAIV				
Method: Robust Least Squares				
Sample: 1979 2019				
Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	17.51344	1.532105	11.43096	0.0000
EXDT	0.189972	0.024372	7.794817	0.0000
INFR	-0.209372	0.064248	-3.258794	0.0011
RGDP	0.092832	0.154018	0.602734	0.5467
TDS	2.038813	0.608939	3.348141	0.0008
	Robust Statistics			
R-squared	0.582685	Adjusted R-squared		0.536316
Rw-squared	0.904322	Adjust Rw-squared		0.904322
Akaike info criterion	79.11870	Schwarz criterion		92.10944
Deviance	1696.833	Scale		4.803448
Rn-squared statistic	253.6097	Prob (Rn-squared stat.)		0.000000

Author's E-views 10 computation

3. Autoregressive Distributed Lag Model table 1

Dependent Variable: CAIV				
Method: ARDL				
Date: 11/01/21 Time: 19:48				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
CAIV(-1)	1.069204	0.171828	6.222514	0.0000
CAIV(-2)	-0.603746	0.220565	-2.737267	0.0112
CAIV(-3)	0.546562	0.181972	3.003552	0.0060
CAIV(-4)	-0.240202	0.125498	-1.913985	0.0671
EXDT	0.020548	0.020496	1.002517	0.3257
INFR	0.016986	0.053046	0.320207	0.7515
RGDP	-0.310799	0.160015	-1.942304	0.0634
RGDP(-1)	0.586972	0.179984	3.261255	0.0032
RGDP(-2)	-0.088682	0.160333	-0.553114	0.5851
RGDP(-3)	-0.281150	0.152294	-1.846105	0.0768
TDS	0.414249	0.479499	0.863922	0.3958
C	4.146540	2.180268	1.901849	0.0688

R-squared	0.971077	Mean dependent var	33.48216
Adjusted R-squared	0.958351	S.D. dependent var	15.22301
S.E. of regression	3.106741	Akaike info criterion	5.361632
Sum squared resid	241.2960	Schwarz criterion	5.884092
Log likelihood	-87.19019	Hannan-Quinn criter.	5.545824
F-statistic	76.30523	Durbin-Watson stat	2.107928
Prob(F-statistic)	0.000000		

4. Error Correction Model Result 1

Dependent Variable: D(CAIV)				
Method: Least Squares				
Sample (adjusted): 1984 2019				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.348733	0.689699	-1.955540	0.0599
D(EXDT)	0.004434	0.026560	0.166941	0.8685
D(INFR)	-0.100552	0.049219	-2.042940	0.0499
D(TDS)	-0.418036	0.516850	-0.808816	0.4250
D(RGDP)	-0.560218	0.164332	-3.409056	0.0019
ECT(-1)	-0.121692	0.280172	-0.434347	0.6671
R-squared	0.370758	Mean dependent var		-1.511667
Adjusted R-squared	0.265884	S.D. dependent var		4.809531
S.E. of regression	4.120833	Akaike info criterion		5.820999
Sum squared reside	509.4378	Schwarz criterion		6.084919
Log likelihood	-98.77799	Hannan-Quinn criteria.		5.913114
F-statistic	3.535284	Durbin-Watson stat		1.643721
Prob(F-statistic)	0.012456			

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