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Security Spending and Public Sector Debt: Implication on Nigeria's Economy.

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Abstract: This paper examines the impact of security spending and public sector debt on real GDP in Nigeria using annual data from 1994 – 2016. The study explores the long and short-run dynamics amongst the variables within the Autoregressive Distributed Lag (ARDL) framework. The Augmented Dickey Fuller (ADF) and Philip Perron's (PP) test reveals that all variables contained a unit root and were integrated of order one I(1). The Bounds test to cointegration confirms the existence of a long-run relationship between security spending, public sector debt and real GDP. The ARDL results suggest that in both long and short-run estimations that an increase in internal security expenditure and domestic debt significantly leads to a rise in real GDP, conversely an increase in defence expenditure and external debt constitutes a fall in real GDP. This study therefore recommends that emphasis should be placed on internal security spending and domestic debt. Again defence expenditure should be greatly reduced especially when compared to a reduction in external borrowings.

Keywords: Internal Security Expenditure; Defence Expenditure; Autoregressive Distributed Lag (ARDL)

JEL Classification: H56; H63

1. Introduction

Within the settings of every economy, the state has the obligation to protect and defend her citizens and territorial integrity from threats emanating from internal or external aggression. The issue of security becomes imperative to the nation as the need arises to separate a portion of security spending from their budget. Security spending can be further decomposed into internal security expenditure and defence expenditure. Internal security expenditure refers to the cost incurred on the protection of citizens, properties and infrastructure within the state by security agencies such as the police, civil defence corps, department of state security, prisons service, etc. Defence expenditure likewise covers that portion of government spending (capital or recurrent) on the acquisition and maintenance of military hardware, intelligence, research-development and payment of armed forces (Army, Navy and Airforce) salaries and other government agencies such as the NIA (National Intelligence Agency) engaged in defence projects.

In recent years, there has been an upsurge in security expenditure across the globe, including Nigeria due to the increased activities of terrorists, militias and home-grown insurgency such as ISIS, Al-Qaeda, Al-Shabab, Boko-Haram, etc. This issue of insecurity has taken a dicey shape, as within the last two decades there has been an alarming increase in the spate of bombings, kidnapping, religious, political and ethnic instability around the globe and in Nigeria particularly. This security challenges has made the country unattractive to investors and thus discourage foreign investors, while also drastically reducing funds necessary to sustain economic development within the country as security expenditure has tremendously moved northwards in terms of sectorial allocation in recent times.

Furthermore, according to World Bank Development Indicators (2016), vast populations of Nigerians live below poverty line, with over 64% of the population living on less than two dollar a day. However, the United Nations Human Development Index (2016) also ranks Nigeria 158 out of 188 countries, which is a significant decrease in its human development ranking of 153 in 2013; likewise World Bank Development Indicators (2012) have placed Nigeria within the 47 poorest countries of

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the world. Despite this lingering issue of poverty a significant quota of the nation's budget is been channelled towards security and debt servicing. This definitely poses a challenge among researchers in determining the impact of such expenditure on the economy and its attendant implication on the public debt structure in the country. Accordingly, apart from the introductory section, this paper is organised into four sections with the second section considering the review of literature, third section the methodology, the fourth section focuses on the results and discussion of findings while the fifth section concludes and makes recommendations.

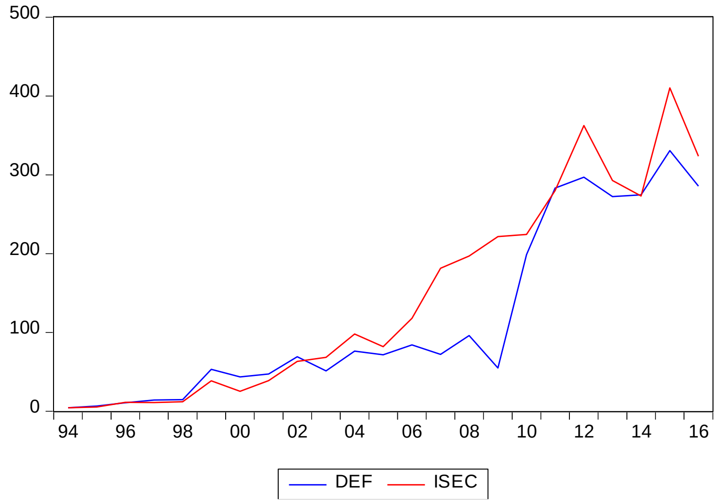


Figure 1. Defence and Internal Security Expenditure in Nigeria, 1994-2016

Source: Central Bank of Nigeria Statistical Bulletin, 2016

2. Literature Review

Various related literatures were analysed for better understanding as to the true nature of the impact of security spending and public debt on economic growth.

2.1. Security Spending and Economic Growth

According to the classical school of thought, they contend that an upsurge in military expenditure is likely to decelerate economic growth. This is based on the presumption that an increase in military spending implies a decrease in the level of private sector investment and domestic savings, which in turn lowers consumption leading to low aggregate demand. On the contrary, the Keynesian school of thought argues that a rise in military spending spikes demand, increases national output, purchasing power and creates positive externalities (Narayan & Singh, 2007).

Ajmair, Hussain, Azeem & Gohar (2018) examined the impact of military expenditure on economic growth in Pakistan from 1990 to 2015 using the bounds test to cointegration. Their findings suggest that short and long run relationship exist between military spending and GDP growth. Ismail (2017) examined the relationship between military expenditure and economic growth in five South Asian countries from 1988 – 2013 using panel data. Their result indicates a positive effect of military expenditure on economic growth.

Phiri (2016) using the logistic smooth transition regression (LSTR) model explored a non-linear relationship between military spending, economic growth and other determinants for the South African economy using time series data from 1988 – 2014. His findings indicated an inverted U-shaped relationship between military spending and economic growth. Korkmaz (2015) studied the effect of military spending on economic growth and unemployment in Mediterranean countries from 2005 – 2012, using panel data analysis. His findings showed that military spending affect economic growth of countries negatively while increasing unemployment. Chang, Lee, Hun and Lee (2014) examined causal linkage between military spending and economic growth in China and G7 countries using time-series data from 1988–2010, focusing on country-specific analysis. Their results showed that military spending was detrimental for both Canada and the UK, while a one-way Granger causality running from economic growth to military spending for China was observed.

Pan, Chang and Wolde-Rufael (2014) re-examined the causal relationship between military spending and economic growth in 10 Middle Eastern countries using a panel causality analysis. Their results indicate unidirectional causality running from military spending to growth for Turkey; one-way causality from economic growth to military spending for Egypt, Kuwait, Lebanon, and Syria; bidirectional causality for Israel; and no causality in either direction for Jordan, Oman, and Saudi Arabia. Aye, Balcilar, Dunne, Gupta and Eyden (2014) investigated the linkage between military expenditure and GDP in South Africa from 1951-2010 using full sample bootstrap Granger non-causality tests. Their findings revealed that causality does not exist between military expenditure and GDP.

Pradhan, Arvin, Norman and Bhinder (2013) in their study on military expenditure and economic growth using a dynamic multivariate causality tests applied to data from 22 countries for the period 1988–2012. Their findings revealed equilibrium relationships between military expenditure and economic growth. Dunne and Tian (2013) using an exogenous growth model within a dynamic panel methodology from 1988-2010 for 106 countries, found that military burden has a negative effect on growth in the short and long run.

Anyanwu (2011) analysed defence spending and economic growth in Nigeria within the Vector Error Correction model, the study found a positive relationship between military expenditure and economic growth in the long and short run. Yang, Trumbull, Yang and Huang (2011) studied the military expenditure – economic growth nexus in 23 countries. His findings revealed that military expenditure has a significant negative relationship with economic growth. Wijeweera and Webb (2011) analysed the effect of military spending on economic growth using panel co-integration technique in the five South Asian countries of India, Pakistan, Nepal, Sri Lanka and Bangladesh for the period of 1988–2007. They found that an increase in military spending increases real GDP.

2.2. Public Debt and Economic Growth

Saifuddin (2016) using a two-stage least square regression estimated the impact of public debt on economic growth in Bangladesh from 1974 – 2014. The findings show that public debt is positively related to both investment and economic growth. Blake (2015) examined the impact of public debt on economic growth using quarterly data from 1990 to 2014 in Jamaica using the autoregressive distributed-lag model. His findings indicate that the public debt has a non-linear impact on economic growth. Lee and Ng (2015) assessed the impact of debt on economic growth in Malaysia from 1991 to 2013 using OLS. Their results suggest that a negative relationship exists between debt and economic growth. Ejigayehu (2013) similarly analysed the effect of external debt on the economic growth of eight selected heavily indebted African countries (Ethiopia, Senegal, Uganda, Mali, Madagascar, Tanzania, Mozambique, and Benin) using the ordinary least square (OLS) from 1991-2010. The findings suggest that external debt affects economic growth.

Musa, Ahmadu and Aminu (2013) studied the nexus between economic growth, external debt and domestic debt in Nigeria for the period 1970 to 2011. They found that external debt has a negative impact on the economic performance of Nigeria, while domestic debt had a positive impact on economic growth. Hassan and Akhter (2012) investigated the impact of debt on economic growth in Bangladesh from 1980-2011 within the vector error correction (VECM) model. Their results reveal the absence of a significant negative relationship between external debt and economic growth. While they found domestic debt has a negative impact on growth.

Minea and Parent (2012) in their paper studied the relationship between debt and growth by using the Panel Smooth Threshold Regressions model. They found that public debt is negatively associated with growth when the debt-to-GDP ratio is above 90 per cent and below 115 per cent. Obademi (2012) used the ordinary least squares (OLS) technique in an augmented Cobb Douglas model studied the impact of public debt on economic growth in Nigeria. The findings suggest that the impact of debt on economic growth was negative and significant in the long-run and positive in the short-run, its impact in the long-run depressed the economy as a result of inefficient debt management. Akpan and Eweke (2017) in their work on currency crises and banking sector performance in Nigeria considered the need for segregating debt and the fact that foreign borrowing should be greatly reduced in favour of domestic debt.

Hence, from the above empirical review, we find that despite cornucopia evidences on the impact of security spending on economic growth, none of these works have actually considered spending on internal security to the best of our knowledge. This therefore represents the gap that this study intends to fill.

3. Econometric Procedure

This study uses the Autoregressive Distributed Lag (ARDL)/Bounds Test methodology proposed by Pesaran and Shin (1999) and Pesaran, Shin and Smith (2001) to estimate the dynamic, long and short-run relationship among the variables. This technique has advantages over other cointegration techniques. Whereas other cointegration test requires that all variables to be integrated of the same order, the ARDL technique can be applied whether the variables are purely 1(0) and/or purely 1(1) or a mixture of 1(0) and 1(1) variables. Furthermore, the bounds test approach within the ARDL framework performs better, as it gives more robust results in small samples than the Johansen cointegration technique which requires a large data sample to obtain a valid result (Pesaran, Shin & Smith, 2001). Likewise, endogeneity problems are tackled in this technique. According to Pesaran and Shin (1999), they contended that modelling the ARDL with the appropriate lags will correct for both serial correlation and endogeneity problems. From the variables of interest, the following model has been specified;

Equation 3.1

$RGDP = f(ISEC, DEF, DOD, EXD)$

Where;

RGDP is the Real Gross Domestic Product (GDP deflated by inflation).

ISEC refers to the funds spent by the government in providing internal security. Thus it includes funds spent on the Police and Civil Defence Corps.

DEF refers to Government Expenditure on securing the territorial integrity of the country. Thus it includes expenditure on the army, navy and airforce

DOD represents domestic debt of the government, i.e. funds sourced from within the country

EXD represents external/foreign debt of the government, i.e. funds sourced from international organizations abroad.

To confirm linearity and also deal with heteroscedascity, a double log-linear model was specified;

Equation 3.2

$logRGDP_{i,t} = \beta_o + \beta_1 logISEC + \beta_2 logDEF + \beta_3 logDOD + \beta_4 logEXD + \varepsilon_{i,t}$

Consequently, upon applying the ARDL methodology, it becomes imperative we specify the ARDL representations of equation 3.2 as:

Equation 3.3

$$\Delta logRGDP_t = \alpha_0 + \beta_1 logRGDP_{t-1} + \beta_2 logISEC_{t-1} + \beta_3 logDEF_{t-1} + \beta_4 logDOD_{t-1} + \beta_5 logEXD_{t-1} + \sum_{j=1}^{n} \varphi_h \Delta\, logRGDP_{t-1} + \sum_{j=1}^{n} \phi_i \Delta\, logISEC_{t-1} + \sum_{j=1}^{n} \lambda_j \Delta\, logDEF_{t-1} + \sum_{j=1}^{n} \underline{\omega}_k \Delta\, logDOD_{t-1} + \sum_{j=1}^{n} \rho_l \Delta\, logEXD_{t-1} + \nu_t$$

Where **Δ** signifies the first difference operator, $\boldsymbol{\alpha_0}$ is the intercept, $\boldsymbol{\beta_1}$ $\boldsymbol{\beta_2}$ $\boldsymbol{\beta_3}$ are the long-run multipliers. **δ**, **ϕ**, **λ**, $\boldsymbol{\underline{\omega}}$ and **ρ** are short-run parameters and $\boldsymbol{\nu_t}$ are white noise errors. This study estimated equation 3.3 with the bounds test in other to access the long-run relationship. The F-test was used to interpret the existence of a long-run relationship amongst the variables in equation 3.3. The null hypothesis of no long-run relationship in equation 3.3 is tested against the alternate hypotheses of a long-run relationship as shown below;

$H_0: \alpha = \beta_1 = \beta_2 = 0$

$H_1: \alpha \neq \beta_1 \neq \beta_2 \neq 0$

The bounds test provides for two asymptotic critical value for cointegration when the dependent variables are 1(d) (where 0≤d≤1): a lower value assuming the regressors are I(0) and an upper value assuming purely I(1) regressors. If the F-statistic is above the upper critical value, the null hypothesis of no long run relationship can be rejected regardless the orders of integration for the time series. Inversely, if the F-statistic falls below the lower critical value, the null hypothesis cannot be rejected. Finally, if the statistic falls between the lower and upper critical values, the result is inconclusive. The approximate critical values for the F-statistic test were obtained from Pesaran *et al.* (2001).

Immediately cointegration is detected the ARDL long-run model for $RGDP_t$ can be estimated as:

Equation 3.4

$$logRGDP_t = \alpha_0 + \sum_{j=1}^{n} \varphi_h \Delta\, logRGDP_{t-1} + \sum_{j=1}^{n} \phi_i \Delta\, logISEC_{t-1} + \sum_{j=1}^{n} \lambda_j \Delta\, logDEF_{t-1} + \sum_{j=1}^{n} \underline{\omega}_k \Delta\, logDOD_{t-1} + \sum_{j=1}^{n} \rho_l \Delta\, logEXD_{t-1} + \nu_t$$

The next step is to obtain the short-run dynamic parameters by estimating an error correction model within the ARDL framework. Thus specified as:

Equation 3.5

$$\Delta logRGDP_t = \mu_0 + \sum_{j=1}^{n} \varphi_h \Delta\, logRGDP_{t-1} + \sum_{j=1}^{n} \phi_i \Delta\, logISEC_{t-1} + \sum_{j=1}^{n} \lambda_j \Delta\, logDEF_{t-1} + \sum_{j=1}^{n} \underline{\omega}_k \Delta\, logDOD_{t-1} + \sum_{j=1}^{n} \rho_l \Delta\, logEXD_{t-1} + \vartheta ECT_{t-1} + \nu_t$$

Where **ϑ** denotes the speed of adjustment of the parameters to the long-run equilibrium following a shock to the system and $\boldsymbol{ECT_{t-1}}$ represents the residuals obtained from equation 3.5. Furthermore, the coefficient of the lagged error correction term **ϑ** is expected to be negative and statistically significant to further confirm the existence of a cointegrating relationship.

4. Results and Discussion of Findings

4.1. Unit Root Test

Before estimating the Bounds test to cointegration, unit root test would be conducted to examine the stationarity process of the variables to ensure that none of the variables are integrated of order two, 1(2) to avoid spurious results. This is necessary because the computed F-statistics by Pesaran, Shin and Smith (2001) are not valid in the presence of 1(2) variables. The study utilized the Augmented Dickey Fuller (ADF) and Phillip Perron (PP) test to access the order of integration amongst the variables. From Table 1, all variables were stationary at I(1).

Table 1. Unit Root Test Results

Variables	ADF Test	Remarks	PP Test	Remarks
logRGDP	-3.229346**	I(1)	-3.044705**	I(1)
logISEC	-6.544384*	I(1)	-10.76285*	I(1)
logDEF	-6.495845*	I(1)	-6.705325*	I(1)
logDOD	-4.204343*	I(1)	-4.216534*	I(1)
logEXD	-3.177011**	I(1)	-3.201250**	I(1)

Source: Authors Computation Using Eviews 9.

*/**/***, indicates significance at 1%, 5% & 10% respectively.

Test includes Trend and Intercept

4.2. Bounds Test

In other to examine the presence of a long-run relationship among the variables, we therefore proceed to estimate equation (3). This study adopts the critical values for F-test as proposed by Narayan (2004) due to our relatively small sample size (22 observations). A maximum of one (1) lag length was selected based on the Akaike info criterion (AIC). According to Table 2, the F-statistic for the model with a value of 13.13995 exceeds the upper critical bound at 10% significance level. We therefore reject the null hypothesis of no cointegration. This indicates the existence of a long-run relationship between economic growth and its explanatory variables.

Table 2. ARDL Bounds Test

F-Bounds Test		Null Hypothesis: No levels relationship		
		Narayan (2004) Critical Value Bounds		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	13.13995	10%	1.7517	3.9220
K	4	5%	2.1650	4.7300
		2.5%	2.6000	5.5140
		1%	3.1900	6.5600

Source: Authors Computation Using Eviews 9

Note: K is the number of regressors

4.3. Long-Run Estimates

Since the variables are cointegrated, we therefore proceed to estimate equation 3.4. From Table 3, the results obtained by normalizing the explanatory variables on economic growth in the long-run, shows that expenditure on internal security (ISEC), defence spending (DEF), domestic debt (DOD) and external debt (EXD) are statistically significant in explaining variations in economic growth. The result suggests that a 1 percent increase in the expenditure on internal security and domestic debt will significantly lead to a 26 and 28 percent rise in economic growth respectively.

Furthermore, it was observed that a rise in defence spending (DEF) and external debt (EXD) will lead to a fall in economic growth. The findings on defence spending corresponds with those of Korkmaz (2015), Chang, Lee, Hun and Lee (2014) Dunne and Tian (2013), while that of external debt buttresses the views of Lee and Ng (2015) and Musa, Ahmadu and Aminu (2013).

Table 3. Estimated Coefficients of the Long-Run Model

Dependent Variable: RGDP

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ISEC	0.265148	0.059012	4.493102	0.0006
DEF	-0.173570	0.045090	-3.849375	0.0020
DOD	0.285920	0.069636	4.105900	0.0012
EXD	-0.056630	0.026921	-2.103583	0.0555
C	8.082420	0.330690	24.44111	0.0000

Source: Authors Computation Using Eviews 9

4.4. Short-Run Dynamics

The study further estimates the short-run relationship among the variables. According to Table 4, the coefficient of the lagged error correction term (ECM_{t-1}) is of the expected negative sign and significant at 1% with economic growth. The ECM captures the speed of adjustment to restore equilibrium in case of any shock to any of the exogenous variables. The coefficient of the error term, -0.402112 which is significant at 1% level, indicates that about 40.2% of disequilibrium from previous year's shock in economic growth converges back to the long-run equilibrium within the current year. This suggests a fair speed of adjustment in the model.

The results obtained from the short-run estimates buttresses the position of the long-run model as all the coefficients of the model has the same signs attached as found in the long-run model.

Table 4. Estimated Coefficients of the Short-Run Dynamic Error Correction Model

Dependent Variable: RGDP

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RGDP(-1)	0.402112	0.123008	3.268999	0.0061
ISEC(-1)	0.106619	0.022372	4.765652	0.0004
DEF(-1)	-0.069794	0.027979	-2.494536	0.0269
DOD(-1)	0.114972	0.059346	1.937320	0.0747
EXD(-1)	-0.022772	0.012310	-1.849889	0.0872
ECM(-1)*	-0.402112	0.038487	-10.44809	0.0000

Source: Authors Computation Using Eviews 9

4.5. Model Diagnostics

To ensure that the model is correctly specified and to avoid spurious results, it is therefore mandatory to examine for model misspecification which may occur due to unstable parameters and afterward lead to bias estimates. From Table 3, the test statistics with its antecedent p-values > 10% significance level indicates that the model is free from Serial Correlation, Heteroskedasticity and the functional form of the model is correctly specified according to the Ramsey RESET Test. Likewise, the Jarque-Bera test statistics (0.0558) indicates that the model residuals are normally distributed.

Furthermore, from Appendix 1, the R^2 with a value of 0.997320 indicates that 99.73% of the variation in economic growth is explained by internal security expenditure, defence spending, domestic debt, external debt and one-period lag of real GDP, while the standard error of 0.022645 signifies that about 2.26% of variations in economic growth will not be explained by the independent variables. The Durbin-Watson statistics of 1.730310 confirms the results of the ARCH test indicating the absence of serial correlation. The Akaike Info Criterion value of -4.445640, suggests that information loss is well minimized by the model. The F-Statistics value of 977.9493 indicates that the overall model is significant at 1% level and is a good fit.

The CUSUM and CUSUMQ of recursive residuals test as suggested by Pesaran and Pesaran (1997) was used to access the coefficient stability in the model. From Appendix 2, the plot of the CUSUM and CUSUMQ of recursive residual stability test indicates that all estimated coefficients of the model are stable over the study period since they are within the 5% critical bounds.

Finally, from the sample forecast of the endogenous variable reported in Appendix 8. The model proves efficient in tracking the historical values of the endogenous variables with high precision as the fits were very impressive as all turning points were remarkably captured. The Root Mean Squared Error and Bias Proportion and of 0.017851 and 0.011249 were remarkably small. This therefore indicates that the model has a good predicative ability.

Table 5. Diagnostics

Diagnostic Test	Test Statistics	P-value
Serial Correlation (Breusch-Godfrey)	0.001277	0.9721
Heteroskedasticity (ARCH)	1.451977	0.2430
Normality (Jarque-Bera)	0.055823	0.9724
Functional Form (Ramsey RESET)	1.802609	0.2103

Source: Authors Computation Using Eviews 9.

5. Conclusion and Recommendations

This study had set forth to provide an insight into the relationship existing between security spending, public-sector debt and economic growth in Nigeria by estimating the long and short-run effect within the ARDL/Bounds Test framework. The study utilized annual data spanning 1994 – 2016. The various unit root tests suggested that all variables where stationary after first difference. The results further support the presence of a stable long-run relationship among the variables as depicted by the Bounds Test to Cointegration.

The findings of the study indicated that in both long and short-run estimations that an increase in internal security expenditure and domestic debt significantly leads to a rise in real GDP, conversely an increase in defence expenditure and external debt leads to a fall in real GDP. The study therefore recommends that emphasis should be placed on internal security spending and domestic debt for economic growth. The level of defence spending should be greatly reduced, much more than external borrowing because the negative impact of defence expenditure is much higher than that of external borrowing. Furthermore, the debt management office (DMO) should properly monitor debt payment obligations so as to avoid debt rising over the threshold limit, which could trigger debt over hang. We therefore share the views of Akpan and Eweke (2017) who stated that the level of foreign borrowing in funding budget deficit within the Nigerian economy be greatly reduced and where the need arises domestic debt be increased.

The government of the day should improve on regional and international integration and cooperation as it will help reduce her expenditure commitment.

6. Appendix

1. Autoregressive Distributed Lag (ARDL) Model Estimation

Dependent Variable: RGDP
Method: ARDL
Date: 02/05/18 Time: 23:25
Sample (adjusted): 1995 2016
Included observations: 22 after adjustments
Maximum dependent lags: 1 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (1 lag, automatic): ISEC DEF DOD EXD
Fixed regressors: C
Number of models evalulated: 16
Selected Model: ARDL(1, 1, 1, 1, 0)

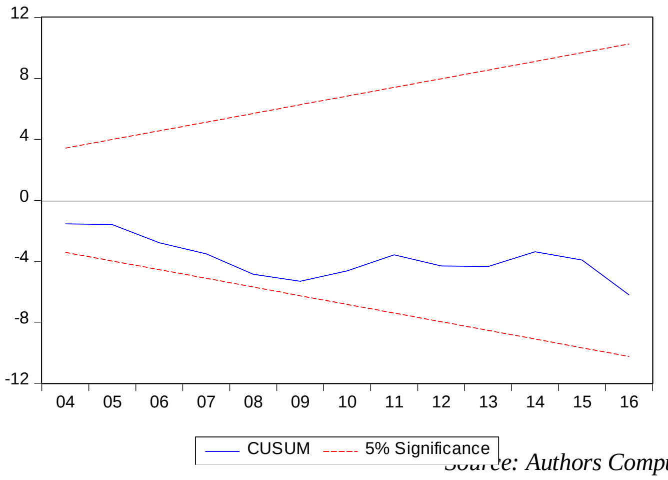
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
RGDP(-1)	0.597888	0.123008	4.860583	0.0003
ISEC	0.051994	0.020928	2.484448	0.0274

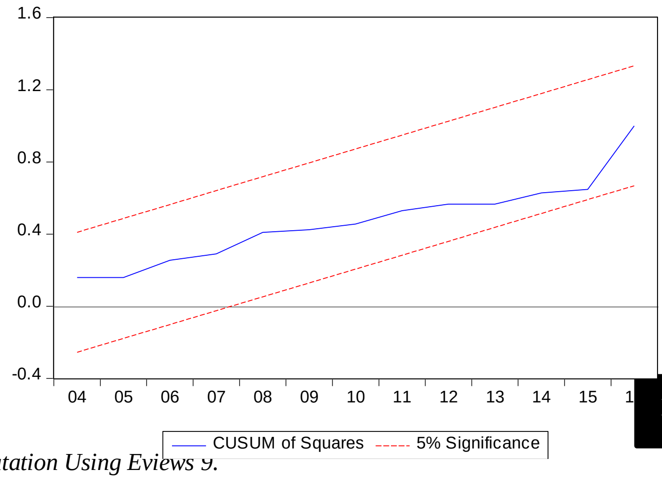
ISEC(-1)	0.054625	0.020724	2.635827	0.0206
DEF	-0.020210	0.020016	-1.009723	0.3311
DEF1(-1)	-0.049584	0.019925	-2.488550	0.0272
DOD	-0.027603	0.062297	-0.443082	0.6650
DOD(-1)	0.142575	0.063350	2.250590	0.0424
EXD	-0.022772	0.012310	-1.849889	0.0872
C	3.250035	0.891792	3.644386	0.0030

R-squared	0.998341	Mean dependent var	10.53956
Adjusted R-squared	0.997320	S.D. dependent var	0.437454
S.E. of regression	0.022645	Akaike info criterion	-4.445640
Sum squared resid	0.006667	Schwarz criterion	-3.999305
Log likelihood	57.90204	Hannan-Quinn criter.	-4.340497
F-statistic	977.9493	Durbin-Watson stat	1.730310
Prob(F-statistic)	0.000000		

Source: Authors Computation Using Eviews 9

2. Plot of Cumulative Sum and Cumulative Sum of Squares of Recursive Residuals Stability Tests





Source: Authors Computation Using Eviews 9.

4. Descriptive Statistics

	RGDP	ISEC	DEF	DOD	EXD
Mean	10.51186	4.305244	4.174342	7.523671	7.169566
Median	10.53143	4.582925	4.272072	7.330346	6.934300
Maximum	11.14221	6.016645	5.800879	9.310928	8.495003
Minimum	9.902443	1.481605	1.437463	6.010237	6.084249
Std. Dev.	0.447566	1.430114	1.275564	1.067847	0.830783
Skewness	0.017689	-0.615106	-0.525828	0.183598	0.236736
Kurtosis	1.493164	2.101381	2.440397	1.757466	1.480088
Jarque-Bera	2.177147	2.224229	1.360004	1.608776	2.428711
Probability	0.336696	0.328863	0.506616	0.447362	0.296901
Sum	241.7727	99.02062	96.00987	173.0444	164.9000
Sum Sq. Dev.	4.406947	44.99496	35.79538	25.08652	15.18442
Observations	23	23	23	23	23

Source: Authors Computation Using Eviews 9

5. Breusch-Godfrey Serial Correlation LM Test

F-statistic	0.001277	Prob. F(1,11)	0.9721
Obs*R-squared	0.002553	Prob. Chi-Square(1)	0.9597

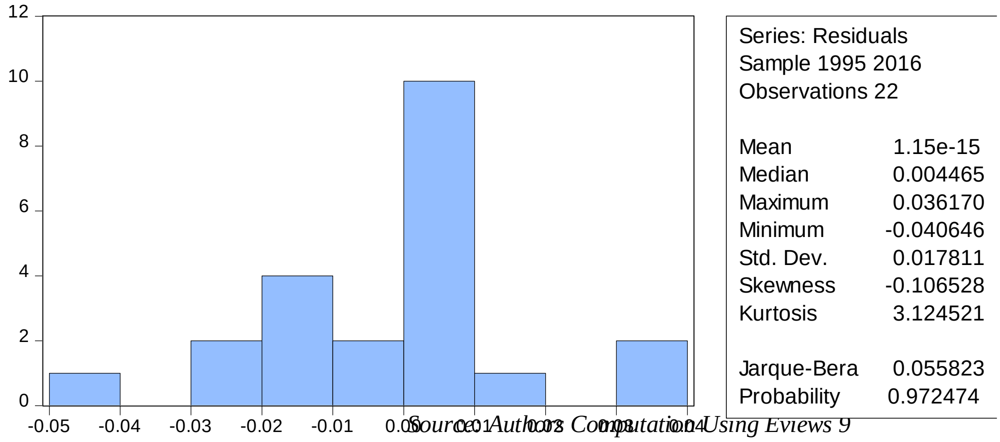
Source: Authors Computation Using Eviews 9.

6. Heteroskedasticity Test: ARCH

F-statistic	1.451977	Prob. F(1,19)	0.2430
Obs*R-squared	1.490884	Prob. Chi-Square(1)	0.2221

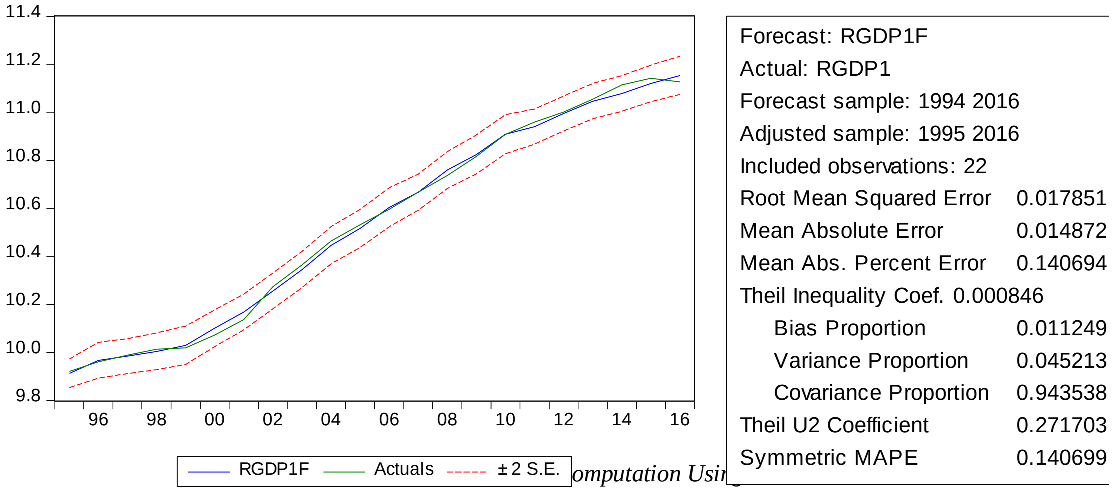
Source: Authors Computation Using Eviews 9

7. Normality Test: Jarque-Bera Statistics



Source: Authors Computation Using Eviews 9

8. Plot of the Forecast Sample



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