Military Spending and External Debt Burden in Nigeria

By

Alexander Abraham Anfofum
Department of Economics
Nigerian Defence Academy PMB 2109 Kaduna
Email: abrahamlex2@gmail.com
Corresponding Author Phone Number: +2348057371739

Hellen Afang Andow
Department of Business Administration,
Kaduna State University, Nigeria.
Email:haandow@yahoo.com

and

Ahmed Nma Mohammed
Department of Accounting
Nigerian Defence Academy PMB 2109 Kaduna
Email: nmaahmed64@gmail.com

Abstract

This study explores the relationship between external debt and military spending in Nigeria over the period 1986 – 2011. The study applied Granger causality, vector autoregressive, variance decomposition and impulse response techniques. The outcome of the results showed long run and a unidirectional causal relationship between military spending and external debt. The response of external debt due to random shock in military spending was positive from the first period up to the fifth period and thereafter became negative all through. The impulse response had a sustained positive short run but negative in the long run horizon. The variance decomposition test revealed that military expenditure own shock on external debt steadily increase external debt. The implication of this study is that any innovations in military policy that does not create spin off effect will trigger external debt burden stock in Nigeria.

Key words: Military Expenditure, External Debt, Econometric models, Nigeria.

1. Introduction

Most developing countries resort to external borrowing in order to bridge domestic resource gap. This will accelerate economic growth and development. It is argued often, that when a borrowing nation channeled appropriately the borrowed resources into productive investment coupled with stable macroeconomic environment; it will enjoy rapid economic growth and settle the nation's debt obligation comfortably (Ashraf and Chaudhary, 2008). Obviously, developing countries borrow because of macroeconomic goals like building dams, efficient supply of electricity and increase consumption.

Ordinarily, the return from a good investment is expected to provide financial resources for the borrowed funds and service the debt in the long run. Unfortunately, Nigeria has been rescheduling debt with an attendant increase in external debt that is unabated. The costs of the external borrowing are supposed to be covered by the future returns from investment. Unfortunately, in Nigeria, most debts repayment have been rescheduled repeatedly, with the effect of a continuous debt increase that is virtually unabated. The empirical investigation of defence expenditure and macroeconomic variables since the seminal work of Benoit (1973) concentrated more on the relationship between defence expenditure and economic growth and its determinants, but the effect of military expenditure on external debt received less attention in Nigeria. In countries with large military outlay, the role of military spending in relation to external debt is important. Obviously, borrowing to finance military good constitutes a drag on economic growth especially for the less developed nations of Africa that are characterized with series of political and religious crises, macroeconomic instability and high level of poverty. Nigeria is a country with large annual military budgetary allocations.

Over the years the volume of military budgetary allocation increased rapidly such that it tripled other competing sectors expenditure, thus the country spends an important portion of its external borrowed fund on defence at the expense of productive sectors like manufacturing, agriculture, construction, health and education. The continued large military outlay in the face of high debt burden may have some potential adverse economic effects on the growth performance of a nation. Borrowing because of economic needs of the society mean no harm, but excessive foreign debt accumulation may be the reason for disequilibrium terms of trade and balance of payment, high inflation rate and deficit finance which becomes a clog in the wheel of economic progress of a country. In 2004 Nigeria received debt forgiveness package from international organization, presently the volume of external debt has increased such that the government dear external debt to oil subsidy removal. This paper investigates the relationship between external debt burden and defence spending in Nigeria between 1986 and 2011. The scope of this study is limited by central bank of Nigeria statistical bulletin for the year 2011. The paper is divided into five sections. Section one is the introduction, which highlight the problem, objectives and scope of the study, section two review relevant literature on external debt defence expenditure nexus, in section three the paper discusses external debt defence expenditure nexus in Nigeria within the scope of the study. In section four the study presents the methodology, results, analysis and findings, while section five is the conclusion and recommendations.

2 Review of Literature.

2.1 Empirical Evidence

Sezgin (2004) examined defence – debt relationships between 1979 – 2000, using a cointegration analysis, the result supports no clear evidence of long run relationship between defence expenditure

and debt. Shahbaz, Shabbir and Sabihuddin (2011) explore the effect of military expenditures on external debt in Pakistan over the period of 1973 – 2009. They apply ARDL bounds testing approach to examine co-integration between the variables. The findings of the study indicate the present of long run relationship between military expenditures, external debt, economic growth and investment. The results revealed that a rise in military expenditure increases the stock of external debt. Defence spending had a positive and a significant impact on the stock of external debt. The findings suggest that an increase spending contributes to the accumulation of Ethiopia's external debt. Feridun (2005) analyses Argentinean Financial Crisis of 2001 by investigating the impact of military expenditure on external debt in Argentina. The Granger-causality test procedure was applied on yearly data between 1971 and 2002. The finding supports the hypothesis that military burden may be important in determining the evolution of debt in developing countries.

Dunne, Perlo-Freeman and Soydan (2004) developed a model for Argentina, Chile and Brazil to assess the effect of military spending on external debt using ARDL bound test approach to cointegration. Narayan and Smyth (2009) investigated the impact of military spending on external debt in some Middle Eastern countries namely Oman, Yemen, Bahrain, Iran and Jordan using Pedroni (2004) approach to cointegration for long run relationship between the variables. The empirical analysis supports stable long run relationship between military spending, external debt and national income. In a causality test study conducted by Feridun (2005), the study was on Brazil and the empirical analysis reported that both variables are independent and no causal relationship exists between external debt and military spending.

In a related development, Kollias, Manolas and Paleologou (2004) used Greek data to explore the relationship between Greece internal and external debt and military spending. The estimated results showed that military spending especially on arms imports increases external debt. This is because expenditures on arms imports are being financed by foreign borrowing. Gunluk-Senesen (2004) assessed the role of defence spending on external debt in Turkey. The conclusion indicated that military equipment expenditures and arms imports are major contributors to the increasing volume of external debt. In a similar situation, Sezgin (2004) in a study conducted in Turkey discovered that military spending affects external debt negatively but arms imports are positively correlated with external debt implying that Turkish arms import has increased external debt. Karagol (2006) applied cointegration and VECM techniques for long run and causal relations between military spending and external debt. The empirical results confirmed cointegration and military spending Granger-caused external debt.

Narayan and Narayan (2008) investigated the relationship between external and internal debts and military and income in case of Fiji Islands using ARDL bounds test approach to cointegration. Their results validated cointegration between the variables and an increase in military spending exploded external and internal debt. Finally, in Ethiopia, Wolde-Rufael (2009) conducted a study to scrutinize the effect of military spending and income on external debt by applying ARDL bounds test approach to cointegration. The empirical exercise showed that long run relationship between external debt, military spending and income exists and a rise in military spending increases external debt. Moreover, Granger causality runs from military spending and income to external debt. This finding was supported by variance decomposition test in the study.

2.2 Military Spending and External Debt Nexus in Nigeria.

In this section, this study discussed the growth profile and composition of Nigerian government defence spending in relation to external debt. Table 1 revealed the composition of defence expenditure and external debt in Nigeria between 1986 and 2011. Nigeria is a developing nation and conflict assumed different dimensions accounting for large volume of defence expenditure with an attendant increase in external debt. Defence spending continued to increase even with the series of agitations for defence spending cut. The aggregate defence spending in 1986 was ₦951.4 million. The total foreign debt in 1986 stood at ₦41452.4 billion and the debt servicing ratio was ₦1631.59 billion. The defence spending as a ratio of external debt was 2.30 percent indicating that large percentage of the external debt went to defence sector in 1986. In 1990 total defence expenditure rose to ₦1606.9 billion with total external debt at ₦298614.4 billion. The rise in defence spending was triggered by Nigeria's active participation in West African regional peace keeping particularly in Liberia and coup d'état in 1990. However, defence expenditure burden on external debt stood at 0.54 per cent. Increase in defence spending continued unabated and in 1999 defence spending reached a peak of ₦580117.74 billion and foreign debt increased to ₦633017.0 billion. This was due to the general election in the country in 1999. In Nigeria, election periods are seriously mare with violence, power tussles, wanton destruction of lives and properties, hence the need to increase defence spending. Irrespective of the country's external reserve, foreign borrowing sustained a tremendous increase within this period.

Between 2000 and 2011 Nigeria witnessed a growing democratic state accompanied with series of internal crises which sustained increase in defence spending. As at 2004 total defence spending and external borrowing stood at ₦76057.3 billion and ₦4890269.6 billion respectively. The surge in defence spending was also accompanied by increase kidnapping of indigenes and foreigners, ethnic and religious violence across the northern and southern part of the country. However, the defence expenditure burden on external debt was highest in 2005 when it was 4.15 per cent, thereafter it declined steadily to 3.08 per cent and 0.39 per cent in 2008 and 2011 respectively. By 2011 kidnapping of both foreigners and indigenes increased tremendously in the Southern states of Enugu, Anambra, Rivers, Ebonyi, Bayelsa and Abia states, whereas the Northern states of Bauchi, Plateau, Kano and Kaduna, Yobe, Borno and Niger and Federal Capital Territory – Abuja, the Islamic extremist sect– Boko Haram unleashed series of attack on Churches, both private enterprises and government installation, leading to a wanton destruction lives and properties. Aggregate defence spending in 2010 was ₦86029 billion, while the total external debt stood at ₦6898450 billion. Between 2006 and 2009 external debt declined significantly but with the increase in federal government revenue, defence spending continued to rise. Basically, defence spending and external debt nexus given Table 1 indicates a positive relationship for Nigeria. Table 1 at a glance supports external debt as a necessity for defence spending and this is because a sizeable portion of defence spending was drawn from external debt resources. The implication is that the extent of military spending burden on external debt is high which stifled other real sectors of the borrowed resources, hence the retard growth rate of these other sectors.

3 Methodology

3.1 Source of Data

Time series data covering 1986 – 2011 was utilized in this study. The data for the study was obtained from various issues of Central Bank of Nigeria statistical bulletin volume 22 and annual report and statement of accounts

3.2 Empirical Framework of the Study

Macroeconomic forecasting model have traditionally been formulated as simultaneous equation structural models. Vector auto-regression (VAR) offers an alternative to structural macroeconomic models for forecasting purposes. In contrast to simultaneous structural models, a VAR model which is preferred in this study is a set of dynamic linear equations in which each variable is determined by every other variable in the model. The VAR model improves the forecasting performance of a model and provides a better interpretation and analysis than the macroeconomic structural simultaneous equation. Therefore, this study adopts a VAR model to explain the relationship between defence spending and external debt in Nigeria. VAR models provide information on impulse responses. Most time series data are non-stationary and using non-stationary variables in the model might lead to spuriousness of regression results (Granger, 1969). In this regard, all the variables were tested using Augmented Dickey-Fuller (ADF) and Phillip Peron (PP) unit root tests. The Johansen cointegration technique was used because it performs better in multivariate model. The cointegration test helps to determine the presence or otherwise of long run equilibrium position of the series in the model.

The estimation procedure is first, to estimate the unrestricted equation using ordinary least square (OLS) process. The deterministic form of the OLS model is expressed as:

ETD = F(TME, GFCF,RGDP, DSR) ……..... 1

The multivariate stochastic form of equation 1 is of the form:

$ETD = \beta o + \beta_1 TME_t + \beta_2 GFCF_t + \beta_3 RGDP_t + \beta_4 DSR_t + \varepsilon_t$…….. 2

Where
ETD = real external debt,
TME = total military expenditure
GFCF = gross fixed capital formation which is a proxy for investment
RGDP = real gross domestic product
DSR = debt service ratio and ε is the stochastic error term while the subscript t is time series data

This study also adopt the causality test procedure to essentially determine whether a past change in one variable - military expenditure causes a current change in another variable - external debt or whether the relationship works in an opposite direction. The Granger causality test is the most applied tool of analysis in this direction. If causality runs from military spending to external debt, it suggests that the past and present values of military spending are significantly different from zero as a group. The same applies to causation that runs from external debt to military spending. However, where the outcome of equation 3 and 4 are significantly different from zero, it means that causation runs from both sides. The model that expressed this behaviour was demonstrated by Granger (1969) and this study takes a lead from Adeolu (2007) and Egbo (2010) who have applied Granger causality test in Nigeria. Given equations 3 and 4 ETD is external debt whereas TME is military spending, k is the lag length and ε_t represent error term.

$$TME_t = M_1 + \sum \gamma i\, TME_{t-1} + \sum \Phi i ETD_{t-1} + \sum {}_{1t} \quad \text{.....3}$$

$$ETD_t = M_2 + \sum \rho_I ETD_{-1} + \sum \theta i TME_{t-1} + \sum {}_{2t} \quad \text{.....4}$$

Where

M_1 and M_2 are constants, and Σ_{1t} and Σ_{2t} are the stochastic term.
The statement of hypothesis is
H_{01} : TME does not Granger cause ETD
H_{02} : ETD does not Granger cause TME

3.3 Characteristics of the variables in the model

External debt (ED) is the dependent variable. Variables like military expenditure (TME), gross fixed capital formation (GFCF), debt service ratio (DSR) and real gross domestic product (RGDP) are the explanatory variables. The need to increase military spending is expected to be positively signed to external debt variable and this is because increase internal insecurity and external aggression will necessitate additional financial resources. Similarly, high debt service ratio is anticipated to have a direct relationship with foreign debt. Whereas, gross capital formation and real gross domestic product are expected to be negatively signed to external debt. This study applied a vector autoregressive (VAR) model in order to obtain a robust result. The VAR model improves the forecasting ability of a model and provides a better interpretation and analysis than the macroeconomic structural simultaneous equation. The vector autoregressive (VAR) model with only one lag in each variable is shown by equation 5:

$$Y_{1t} = a_{11}Y_{1,\,t-1} + a_{12}Y_{2,\,t-1} + e_{1t} \quad \ldots\ldots\ldots\

level. It is confirmed from the Maxmum-Eigen statistic test in Table 4 that the null hypothesis is rejected at 5 per cent levels. This implies that the results of the unrestricted co-integration rank test confirmed a long run significant relationship between external debt (ETD) and its explanatory variables: military expenditure (TME), real gross domestic product (RGDP), gross fixed capital formation (GFCF) and debt servicing ratio (DSR). This finding supports the work of Shahbaz, Shahbaz and Sabihuddin (2011).

4.3 The Long Run regression

The result of the long regression is presented in equation 7 below

$$ETD = -109106 + 43.49TME + 9.546DSR + 6.771RGDP - 6.228GFCF \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots 7$$

(3.61) (4.31) (1.27) (-7.65)

$R^2 = 0.79$ $R^{-2} = 0.75$, DW = 1.75

The result showed that the independent variables in the model are a good predictor of the behaviour of the dependent variable. This is because the adjusted coefficient which is 0.75 indicates a total of 75 per cent explanatory power of the independent variable over the dependent variable. The Durbin Watson statistic test of 1.75 does not suggest the presence of serial correlation. Obviously, the model is a good fit. The result of the long run regression line showed that military expenditure is signed positive. This is an indication that an increase in military expenditure by 1 per cent will increase external debt by 43.5 per cent and it is significance at 5 per cent level. Similarly, the debt service ratio and gross domestic product are positively signed and significantly linked to external debt at 5 per cent level. A 10 per cent increase in debt service ratio and real gross domestic product will lead to 95.46 per cent and 67.71 per cent increase in debt service ratio and real gross domestic product respectively. The gross fixed capital formation used as a proxy for investment is signed negative but, statistically significant at 5 per cent level. The result suggests that investment does not have the capacity to reproduce itself; neither does it have the financial resources to pay back the borrowed funds. This has been the position of Nigeria prior to the external debt forgiveness package in 2004. This inability to repay debt hinged on the series of corruption, absence of transparency and accountability and the growing level of insecurity in the economy.

4.4 Sensitivity Analysis and Stability Test

The long run regression model pass through diagnostic tests regarding serial correlation, autoregressive conditional, white heteroscedisticity and normality of error term. The diagnostic test conducted for this study as depicted in table 5 suggests that the model pass through the Ramsey RESET stability test which satisfies that the functional form of the model was adequately specified. This is an indication of the absence of specification errors in the model. The residual test showed no evidence of autoregressive conditional heteroscedisticity, thus, confirming the evidence of no serial correlation in the long-run regression line. This lend support to Durbin Watson statistic test. The diagnostic test showed evidence of normality in the variables used for this study.

4.5 The Pairwise Granger causality test result

The Pairwise Granger causality test result in Table 6 indicates that military spending Granger causes external debt in Nigeria. The estimated Granger result showed that there are no bilateral or bidirectional relations between external debt and military spending. Obviously, the null hypothesis of military expenditure does not Granger-cause external debt is rejected in this study. This result simply concludes that the macroeconomic variables, defence spending and external debt are unidirectional with causality running from military expenditure to external debt. This outcome supports the work of Andreas and Anastasios (2011) but does not give credence to Karagol (2006)

and Feridun (2005). This result was estimated with two lag lengths at 5 per cent level of significance.

4.6 The Result of the Estimated VAR Model

The result of the estimated vector autoregressive (VAR) model in Table 7 suggests that military expenditure is positive with a long run effect on external debt in Nigeria. The coefficient of military spending is significant at 5 per cent level. This positive relationship was anticipated for this study. The result of this study is in consonance with Shahbaz, Shabbir and Sabihuddin (2011) and Narayan and Smyth (2009), but disagreed with the position of Sezgin (2004). Certainly, the series of incessant security challenges in Nigeria kick start the pressing need for increase defence spending that hinge on foreign borrowing. The outcome of the estimated result also revealed that debt service ratio had a positive short run impact on military spending but a negative long run impact on military spending. The coefficient of debt service ratio is significant at 5 per cent level. This negative long run impact is an indication of how debt service ratio reduces the actual amount of resources allocated to military spending.

4.7 Result of the Variance Decomposition

The variance decomposition result in the table 8 is for TME, ETD and DSR. The basic source of variation in all the variables are the "own" shock. The external debt "own" shock declined consistently from 94 per cent in the first period all through to 53 per cent in the tenth period. Thus the external debts "own" shock in the short run and long run horizons was a decreasing effect. The military expenditure own shock declined from 100 per cent in the first period to 84 per cent in the tenth period. Military spending shock on external debt showed a substantial increasing effect on external debt. Military spending own shock increase external debt from 0.0 per cent to 3.0 per cent within the entire period of study. This result validates the high effect of military spending burden on external debt as obtained in table 1 of this study.

4.8 Impulse Response Function

The impulse response function in figure 1 basically presents the direction of response due to random shock of independent variables on dependent variable. The response of external debt due to policy response in military spending was negative in the short run but became positive in the long run. This outcome suggests that any policy issue as a result of internal crisis or external aggression has the capacity to increase external debt stock in Nigeria. This outcome support the theory of David Ricardo on the need for external debt as a source of financing war expenditure instead of increase public taxation.

5. Conclusion

This study empirically investigates the relationship between external debt and military spending in Nigeria over the period 1986 – 2011. The variables for this study were tested for stationary level using ADF and PP test statistics. Using the approach to cointegration, Granger causality tests and vector autoregressive techniques, the study finds a long run unidirectional causal relationship running from military spending to external debt. Military spending, real gross domestic product and debt service ratio had a positive impact on the stock of external debt. Only real gross domestic product was statistically insignificant at 5 per cent. The findings suggest increase in military spending contributes to the accumulation of Nigeria's external debt. The robust VAR result showed that military spending had a positive and significant impact on external debt both in the short run and long run horizon. The response of external debt to innovations in military spending was

documented. While impulse response had a sustained positive influence on external debt in the long run, the short run position indicated a negative response of external debt to military spending. The variance decomposition result revealed that a military spending shock largely influence external debt in an increasing manner. This study recommends innovation in military or defence policy which can create spin off effect that will impact positively on the society. This will help to reduce external debt stock in Nigeria.

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Table 1: External debt and defence expenditure

	Defence expenditure	**External Debt**		**Defence burden and External debt ratio**		
Year	TME	ETD	DSR	GDP	TME as % 0f GDP	TME as% Of ETD
1986	951.4	41452.4	1631.59	69147.0	1.32	2.30
1987	736.2	100789.1	3928.95	105222.8	0.68	0.73
1988	1101.3	133956.3	9238.70	139085.3	0.77	0.82
1989	108.4	240393.7	13273.70	216797.5	0.50	0.45
1990	1606.9	298614.4	23822.2	267550.0	0.59	0.54
1991	2245.3	328453.8	26414.4	312139.7	0.71	0.68
1992	2706.6	544264.1	19400.26	532613.8	0.51	0.13
1993	4171	633144.4	81081.58	683869.8	0.61	0.66
1994	5491.9	648813.0	49400.32	899863.2	0.61	0.85
1995	7375.6	716865.6	51058.4	1933211.6	0.38	1.03
1996	14095.6	617320.0	53047.5	272719.1	0.52	2.28
1997	15428	595931.9	68539.74	2801972.6	0.55	2.59
1998	21278.6	633017.0	64394.53	2708430.9	0.78	3.36
1999	32947.7	2577374.4	30843.38	3194015.0	0.99	1.28
2000	40074.3	3097383.9	131048	452127.3	0.85	1.29
2001	63471.6	3176291.0	155416.2	4725086.0	1.18	2.00
2002	108147.4	3932844.8	16811.3	6912381.3	1.74	2.75
2003	61723.3	4478329.3	363510.3	8487031.6	1.00	1.38
2004	76057.3	4890269.6	382509.9	11411066.9	1.78	1.56
2005	111869	2695072.2	39395.43	14572239.1	1.73	4.15
2006	98360	451461.7	415362.8	18564594.7	1.52	2.17
2007	117315	431079.8	511643.7	20657317.7	1.85	2.72
2008	151940	493180.2	381200	24296329.3	2.40	3.08
2009	86029.4	590441.2	251791.2	24794238.7	0.04	0.15
2010	86029.4	6898450	415621.0	29205783.0	0.24	0.21
2011	348000.0	8731810	527182.7	37936747.9	0.09	0.39

Source: Computed from CBN statistical bulletin 2011.

Table 2: Result of Unit Root Test Using Augmented Dickey Fuller (ADF) and Phillip Peron (PP) Test Statistics

Variables	95% ADF Test	Critical Value	Order of integration	95% PP Test	Critical Value	Order of integration
ETD	-4.647486	-3.8067 -3.0199 -2.6502	I(2)	-4.981812	-3.7856 -3.0114 -2.6457	I(2)
TME	-3.477468	-3.7856 -3.0114 -2.6457	I(1)	-4.403589	-3.7667 -3.0038 -2.6417	I(1)
DSR	-6.866612	-3.7855 -3.0114 -2.6457	I(1)	-7.214403	-3.7667 -3.0038 -2.6417	I(1)
RGDP	-3.022697	-3.8067 -3.0199 -2.6502	I(2)	-7.570399	-3.7856 -3.0114 -2.6457	I(2)
GFCF	-9.912133	-3.8067 -3.0199 -2.6502	I(2)	-9.006559	-3.7856 -3.0114 -2.6457	I(2)

Source: Computed from econometric views by the author

Table 3: the Johansen co-integration - Unrestricted integration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigen Value	Trace Statistics	0.05 Critical Value	Prob*
None *	0.985790	199.4922	69.81889	0.0000
Almost 1*	0.961250	118.6695	47.85613	0.0000
Almost 2*	0.765803	56.90761	29.79707	0.0000
Almost 3*	0.702783	29.32735	15.49471	0.0002
Almost 4*	0.281258	6.274811	3.841466	0.0122
Trace test statistics 5 cointegration equations at the 0.05 level *denotes rejection of the null hypothesis at the 0.05 level **MacKinnon- Haug-Michelis (1999) p-value				

Source: Computed from econometric views by the author.

Table 4: Unrestricted Co integration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigen Value	Max-Eigen Statistics	0.05 Critical Value	Prob**
None *	0.985790	80.82263	33.87687	0.0000
Almost 1*	0.961250	61.76192	27.58434	0.0000
Almost 2*	0.765803	27.58026	21.13162	0.0054
Almost 3*	0.702783	23.05253	14.26460	0.0016
Almost 4*	0.281258	6.274811	3.841466	0.0122
Max-eigen value test indicates 5cointegration equations at the 0.05 level Trace test indicates 5 cointegrating equations at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level				

Source: Computed from econometric views by the author.

Table: 5 Sensitivity and Stability Test

Diagnostic Test Result		
	Statistic	**Probability**
J-B Normality Test	1.567305	0.142649
Breusch-Godfrey LM Test	1.878345	0.176613
ARCH LM Test	1.134774	0.644240
White Heteroskedasticity Test	0.570539	0.388459
Ramsey RESET	0.354574	0.786535
R^{-2}	0.75	
Durbin Watson Test	1.75	

Computed from econometric views by the author

Table 6: The Pairwise Granger Causality Test Result

Null hypothesis	Observation	F- statistics	Probability	Conclusion
ETD does not Grange cause TME	23	0.60992	0.5549	R
TME does not Grange cause EDT		6.66950	0.0150	A
RGDP does not Grange cause TME	23	1.58575	0.2336	R
TME does not Grange cause RGDP		5.33539	0.0159	A
DSR does not Grange cause TME	23	3.84838	0.0466	R
TME does not Grange cause DSR		2.75464	1.0005	R

Note: R = rejection, A = accepted. Source:
Computed from econometric views 7 software by the author.

Table 7: Vector Autoregressive Result.

Vector Autogregression Estimates
Date 30/05/13 Time: 03:19
Sample (adjusted): 1988 2009
Included observations 19
Excluded observations: 3
Standard errors in ( ) & t-statistics [ ]

	TME	ETD	DSR	RGDP	GFCF
TME(-1)	0.754070 (0.35127) [2.14668]	44.84944 (14.5557) [3.08123]	3.357682 (0.95995) [3.49776]	0.958051 (0.27708) [3.45769]	4.396748 (1.27879) [3.43821]
TME(-2)	0.500434 (0.59668) [0.83870]	85.27302 (24.7247) [3.44890]	3.010146 (1.63060) [1.84604]	0.598543 (0.47065) [1.27173]	0.013194 (2.17218) [0.00607]
ETD(-1)	-0.006012 (0.00854) [-0.70367]	0.319898 (0.35402) [0.90362]	0.002830 (0.02335) [0.12122]	-0.003264 (0.00674) [-0.48432]	-0.032320 (0.03110) [-1.03914]
ETD(-2)	0.015605 (0.00662) [2.35809]	-0.576000 (0.27421) [-2.10056]	-0.025259 (0.01808) [-1.39674]	0.008416 (0.00522) [1.61225]	0.014860 (0.02409) [0.61684]
DSR(-1)	0.192827 (0.12170) [1.58442]	14.73758 (5.04298) [2.92240]	-0.457685 (0.33259) [-1.37614]	0.139167 (0.09600) [1.44970]	-1.512097 (0.44305) [-3.41293]
DSR(-2)	-0.363765 (0.12421) [-2.92869]	-12.37382 (5.14679) [-2.40418]	0.659407 (0.33943) [1.94267]	0.110673 (0.09797) [1.12962]	0.396411 (0.45217) [0.87668]
RGDP(-1)	-0.670266 (0.33825) [-1.98157]	-28.85430 (14.0161) [-2.05866]	-1.822369 (0.92436) [-1.97148]	-0.062078 (0.26681) [-0.23267]	0.478998 (1.23138) [0.38899]
RGDP(-2)	0.444186 (0.30906) [1.43720]	25.93142 (12.8067) [2.02483]	2.262219 (0.84460) [2.67844]	0.480932 (0.24378) [1.97277]	0.779747 (1.12513) [0.69303]
GFCF(-1)	-0.197965 (0.13087) [-1.51271]	-16.48048 (5.42279) [-3.03911]	0.460772 (0.35763) [1.28839]	-0.023284 (0.10323) [-0.22557]	1.358801 (0.47642) [2.85212]
GFCF(-2)	0.342406 (0.10602) [3.22978]	10.40415 (4.39297) [2.36836]	-0.924214 (0.28972) [-3.19005]	0.021694 (0.08362) [0.25942]	-0.597324 (0.38594) [-1.54770]
C	58900.25 (38619.0) [1.52516]	1987609. (1600262) [1.24205]	-60847.58 (105538.) [-0.57655]	145571.0 (30462.2) [4.77875]	-280965.4 (140591.) [-1.99846]
R-squared	0.977877	0.949991	0.978823	0.998160	0.998241
Adj. R-squared	0.950224	0.887479	0.952352	0.995859	0.996042
Sum sq. resids	1.34E+09	2.29E+12	9.98E+09	8.31E+08	1.77E+10

S.E. equation	12922.63	535476.3	35314.81	10193.19	47044.16
F-statistic	35.36172	15.19700	36.97742	433.8812	453.9537
Log likelihood	-198.6103	-269.3697	-217.7115	-194.1024	-223.1604
Akaike AIC	22.06424	29.51260	24.07489	21.58972	24.64846
Schwarz SC	22.61102	30.05938	24.62167	22.13650	25.19524
Mean dependent	59534.00	1633325.	169293.0	409761.3	687899.6
S.D. dependent	57921.41	1596332.	161784.5	158401.5	747752.0

Determinant Residual Covariance	6.27E+44	
Log Likelihood (d.f. adjusted)	-1114.725	
Akaike Information Criteria	123.1289	
Schwarz Criteria	125.8628	

Computed from econometric views 7 software by the author.

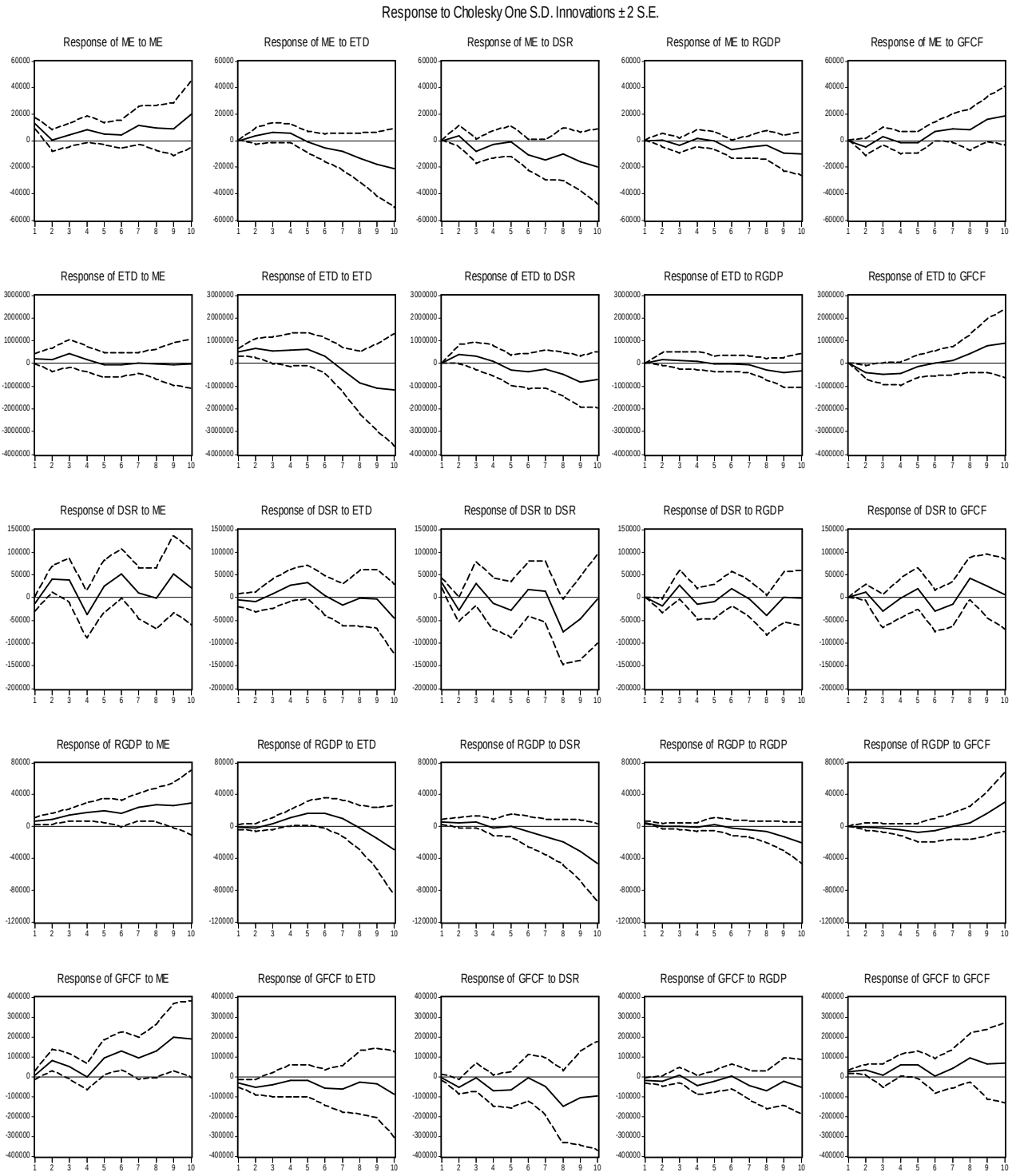
Table 8: Variance Decomposition Function

PERIOD	**VARIANCE DECOMPOSITION OF MILITARY EXPENDITURE**			
	SE	TME	ETD	DSR
1	1.956058	100.0000	0.000000	0.000000
2	2.312584	92.53646	0.026928	7.436610
3	2.547189	85.93386	1.326670	12.73947
4	3.079437	87.87179	2.928131	9.200079
5	3.538585	86.75834	3.149668	10.09199
6	3.818188	81.78489	3.511278	14.70383
7	4.301462	83.52404	3.692067	13.28430
8	4.961639	85.38878	3.101904	11.50932
9	5.470700	83.85704	2.717565	13.42540
10	6.049715	84.09234	2.551945	13.35571
PERIOD	**VARIANCE DECOMPOSITION OF EXTERNAL DEBT**			
	SE	TME	ETD	DSR

1	6.835824	5.362286	94.63771	0.000000
2	1.226755	14.38141	85.44208	0.176502
3	1.779570	36.15232	61.10669	2.740982
4	2.083016	47.01685	50.59377	2.389383
5	2.129164	48.77387	48.51201	2.714118
6	2.178619	47.98191	49.25749	2.760607
7	2.262243	45.23896	51.88822	2.872818
8	2.355062	42.21468	53.12662	4.658707
9	2.410733	40.74582	53.63367	5.620503
10	2.429714	41.01826	53.30940	5.672337
PERIOD	**VARIANCE DECOMPOSITION OF DEBT SERVICE RATIO**			
	SE	TME	ETD	DSR
1	6.574590	25.68328	0.029202	74.28751
2	7.888707	40.73423	3.178512	56.08726
3	1.209671	73.75293	1.358796	24.88828
4	1.314462	62.51631	1.311369	36.17230
5	1.335707	61.63565	2.001918	36.36243
6	1.671175	73.91475	1.720000	24.36525
7	1.772288	72.30551	1.529906	26.16458
8	1.826351	68.35076	1.791385	29.85750
9	2.039670	73.78230	2.219201	23.99850
10	2.246180	77.21364	1.931156	20.85520

Cholesky Ordering: TME EFD DSR. Source: Computed from econometric views 7 software by the author.

Figure 1: Impulse Response



Source: Computed from econometric views 7 software by the author