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An Examination of the Validity of Ricardian Equivalence Hypothesis in Nigeria

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Abstract
This study tested the validity of Ricardian Equivalence Hypothesis (REH) econometrically using quarterly data from the period 1985Q1 to 2014Q4. Autoregressive Distributed Lag (ARDL) bound test as developed by Pesaran, Shin and Smith (2001) was employed to investigate the dynamics of the long-run relationship streaming from disposable income, government final consumption expenditure, government debt, government budget deficit to private consumption expenditure. More remarkably, increased government spending is instigated by the rapt choice of debt and tax. The result of the study demonstrated that, REH does not hold in Nigeria because debt is considered as net wealth and consumers neither live forever nor become concerned about the next generation as much as they care about themselves. Equally, REH proposition has been invalidated by the standard Wald test on the ground that, capital markets are imperfect with borrowing constraints; private and public sectors have different planning horizons and taxes are distortionary in Nigeria.Therefore, increase in government spending rely on the fiscal capacity of Nigeria and the political process. Results of this study however draw attention to the efficacies of fiscal policy in expanding private consumption, controlling budget deficit and macroeconomic stabilization in Nigeria.
Keywords: Ricardian equivalence hypothesis, ARDL model, bound testing, debt for tax swap.

1. Introduction

It has been revealed over time by economic theory that, government uses fiscal policy in order to incite economic growth in an event of shortfall. Government to this effect reduces tax with the intention of increasing the seeming wealth of consumers in order to boost their consumption budgets. Therefore, aggregated demand and capital accumulation are increased due to the new consumption position and accordingly leads to an expansion in economic growth (Anyanwu, 1997). This Keynesian proposition attracted fierce debate in macroeconomic policy formulation both theoretically and empirically in respect to how the deficit should be financed particularly between debt and tax as contended by Sunge, Shylet and Simion, (2015). It was further maintained by this school of thought that, consumers treat government bonds as net wealth. Thus, in an event of tax cut, consumers tend to increase their aggregate consumption as income increases while private savings remain unchanged because consumers prefer present consumption to past and failed to treat the welfare of the future generations with utmost priority.

The theory establishing the relationship between public deficit and private savings was established by David Ricardo and later strengthened by Barro (1974) as Ricardian Equivalence Hypothesis. According to Barro, taxation and public debt issue wield the same effect since consumers consider government debt as future tax liabilities in deficit financing. As acknowledged by Afzal, (2012); Barro, (1989); Likita, (2014); Saeed & Khan, (2012); and Barnheim, (1989); it does not matter whether public deficit is financed by raising tax rates or by borrowing from the private sector because more borrowing now means higher rates of tax in the future for debt repayment. If the current amount of public debt is high, private households tend to save more as antidote to the higher taxes that will be imposed on them by the government in order to finance the borrowed funds (Ghatak & Ghatak, 1996; Reitschuler & Cuaresma, 2004). Thus, if both the government and the households respect their inter-temporal budget constraints, borrowing now or raising tax now are equivalent strategies of financing deficit. In lieu of these two schools of thought, if Nigerian consumers are Ricardian, Adji (2007) maintained that fiscal policy is ineffective and if they behaved like Keynesian, fiscal policy is effective in macroeconomic stabilization; however, these influences boil down to how consumers treat government debt in the context of net wealth.

Owing to the theoretical inconclusiveness of previous studies done in Nigeria by Likita, (2014); Oseni and Olomola, (2013); Orji, Onyeze and Edeh, (2014); Akanbi, (Undated); and Okpanachi, (1998); empirical test on REH in Nigeria became imperative. In this research, attempt has been made to examine the validity of Ricardian Equivalence Hypothesis in Nigeria using quarterly data from 1985Q1 to 2014Q4. Studies on REH in Nigeria suffers from paucity of empirical work and thus, this paper will add to other extant works and depart from few studies done in Nigeria by considering the influence swap in debt-for- tax have on private consumption using Autoregressive Distributed Lag (ARDL) Bound Test Approach developed by Pesaran, Shin and Smith,

(2001).The remaining parts of the study have been structured into methodology for section two, results and discussions for section three and section four concludes the study.

2.0 Methodology

2.1 Standard Reduced-form consumption function

The empirical analysis of REH is vast and structured in a manner that can capture the effect swap of debt-for-tax have on either aggregate consumption or interest rates. While some studies employed reduced-form consumption functions, others used the Euler Equations Function (EEF). However, this study used the reduced standard consumption function utilized by Perelman and Pestieau (1993) with little modification to affirm whether Ricardian Equivalence Hypothesis holds in Nigeria. The proposed consumption function is as established below:

$$\Pr c_t = \delta_0 + \delta_1(Y_t - Tx_t) + \delta_2 G\exp x_t + \delta_3 Gbd_t + \delta_4 W_t + \delta_5 Db_t + \mu_t \quad ----------(2.1)$$

From equation 2.1 above, an explicit function estimable can be specified after taking the natural logarithm of both sides as:

$$\ln \Pr c_t = \delta_0 + \delta_1 \ln Dy_t + \delta_2 \ln G\exp_t + \delta_3 \ln Gbd_t + \delta_4 \ln W_t + \delta_5 \ln Db_t + \mu_t \quad ----------(2.2)$$

From equation 2.2 above, δ_0 is the constant or intercept, While $\delta =_{1-5}$ are the elasticity coefficients of the parameter estimates. Where Prc_tdepicts household consumption expenditure at time t, Dy_t represents disposable income at time t, $Gexp_t$as the general government final consumption expenditure at time t, $W_t$points out the total private owned wealth at t, Gbd_t explains the government budget deficits at time t, Db_t describes government debt at time t, ln as natural logarithm operator and u_t as the white noise error term.

2.2 Data Description

From equation 2.2, Prc_t denotes private household consumption expenditure appraised by the market value of all goods and service purchased by the households at time t, Dy_tdesignates disposable income left to the households after tax might have been deducted at time t, $Gexp_t$ shows the general government final consumption expenditure including current purchases of goods and services at time t, $W_t$indicates the total private wealth defined as the money and bonds holding at time t, Gbd explains the government budget deficit proxied by the difference between revenue and expenditure over the period of the study, Db_t illustrate government debt proxied by the aggregate of domestic and external debt at time t and u_t is the white noise error term. The study used time series quarterly data from 1985Q1 to 2014Q4 sourced from Central Bank of Nigeria (CBN, 2015) statistical bulletins and statement of accounts.

2.3 Econometric approach

In order to investigate the long-run cointegration relationship among the variables in equation 2.2, the study employs Autoregressive Distributed Lagged (ARDL)-Bounds testing approach. This test was developed by Pesaran and Shin (1997) and later extended by Pesaran, Shin and Smith (2001). This model has some advantages over other symmetry measures such as Johansen (1991) and Engle and Granger (1987) cointegration approaches because it can be applied irrespective of whether the variables in the model are endogenous, integrated of order one or zero, and even if the sample size is small (Haug, 2002; Harris & Sollis, 2003; and Odhiambo, 2010); also, the short and long run parameters can be simultaneously estimated and finally, it uses time series data flexible enough that can accommodates structural breaks (Pesaran, et al, 2001). Most remarkably, Quattara (2004) argued that, in the presence of I (2) variables, the F-statistics provided by Pesaran et al. (2001) are not pragmatic because bound tests are based on the premise that the variables are either I(1) or I(0) process.

To this effect, the study used the(ARDL) Bound Test approach developed by Pesaran et al. (2001) from equation 2.2 to determine whether REH holds in Nigeria. It is a dynamic unrestricted error correction model (UECM) that can be explicitly driven from the ARDL bounds test by way of a simple linear conversion of short-run and long-run dynamic equilibrium created without losing any relevant long-run information expressed as:

$$\ln \Pr c_t = \alpha + \theta_1 \ln \Pr c_{t-1} + \theta_2 \ln Dy_{t-1} + \theta_3 \ln G\exp_{t-1} + \theta_4 Gbd_{t-1} + \theta_5 \ln Db_{t-1} + \sum_{i=1}^{p} \lambda_i \Delta \ln \Pr c_{t-i} + \sum_{j=1}^{p} \lambda_j \Delta \ln Dy_{t-j}$$

$$+ \sum_{m=1}^{p} \lambda_m \Delta \ln G\exp_{t-m} + \sum_{n=1}^{p} \lambda_n \Delta Gbd_{t-n} + \sum_{q=1}^{p} \lambda_q \Delta \ln Db_{t-q} + \mu_t \quad ----------(2.3)$$

Where α denotes the intercept, $\theta =_{1-5}$ refers to the long-run multipliers and $\lambda =_{i,j,m,n,q}$ describes the short-run parameters. While Δ is the first difference operator, p is the optimal lag length to be decided by Schwarz Bayesian Information Criterion (SBC) while other variables retained their meanings as previously explained. If government expenditure is held constant, disposable income and budget deficit can be aggregated

to give rise to the effect of tax-for debt swap on current private consumption.

To investigate if long-run relationship exists among the variables in equation 2.3 given the decided lag length requires the use of Wald test (F-test). This is undertaken using the Ordinary Least Square technique on the collective significance of the coefficients of the lagged variables with the F-statistics computed under the null hypothesis. For Ricardian Equivalence Hypothesis to hold in Nigeria, the following restrictions must be met:

$\theta_2 + \theta_4 = 0,\ \theta_5 = 0$, and $\theta_3 < 0$. This means that, For REH to hold, Government consumption expenditure (θ_3) has to be less than zero indicating government final consumption expenditure has a negative effect on private final consumption of goods and services while the swap in the use of debt for tax spending leaves private consumption unchanged (i.e. $\theta_2 = \theta_5 = 0$). Due to variable constraints and its seeming collinearity with debt as one of its proxy, wealth has been dropped as a variable since it has no significant effect on the model.

More resoundingly, the rejection of the null hypothesis is based on the asymptotic distribution of the F-statistic that is non-standard irrespective of whether the variables are I(0) or I(1) that suggests the Cointegrating relationship. In the critical bounds tabulated by Pesaran et al. (2001) with two sets of appropriate critical values. One set assumes all variables are I(1) and the other as I(0). If the F-calculated statistic lies above the upper bound I(1), the null hypothesis is rejected and thus infers that cointegration exists. On the other hand, if the F-statistic is below the lower bound, it indicates no cointegration. Consequently, it is indeterminate if the F-statistic falls in between the lower and upper critical bounds.

If a long-run and stable relationship is supported by equation 2.3, then the Augmented ARDL(r, q, n, m, b) model will be established as thus:

$$\ln \Pr c_t = \rho_0 + \sum_{i=1}^{r} \rho_{1i} \ln \Pr c_{t-i} + \sum_{i=1}^{q} \rho_{1i} \ln Dy_{t-i} + \sum_{i=1}^{n} \rho_{1i} \ln G\exp_{t-i} + \sum_{i=1}^{m} \rho_{1i} Gbd_{t-i}$$

$$+ \sum_{i=1}^{b} \rho_{1i} \ln Db_{t-i} + \varepsilon_t \text{..... ....} \quad (2.4)$$

Once estimation of the related long-run multipliers are accomplished, the short-run dynamic coefficients will be investigated using error correction model (ECM) of ARDL as expressed below in equation 2.4by way of:

$$\ln \Delta \Pr c_t = \theta + \sum_{i=1}^{r} \alpha_i \Delta \ln \Pr c_{t-i} + \sum_{j=1}^{q} \omega_j \Delta \ln Dy_{t-j} + \sum_{m=1}^{n} \varphi_m \Delta \ln G\exp_{t-m} + \sum_{n=1}^{m} \varpi_n \Delta Gbd_{t-n} + \sum_{q=1}^{b} \delta_q \Delta \ln Db_{t-q}$$

$$+ \rho ECM_{t-1} + \varepsilon_t \text{----------} \quad (2.5)$$

From equation 2.5, ECM_{t-1} represents the error correction term towards long-run equilibrium after short-run shock whereas ρ illustrate the speed by which the parameters converges to equilibrium. The coefficient of the error term must be negative and significant to ensure convergence of the long-run dynamics towards equilibrium. The value of ρ vary between -1 and 0. When the coefficient is -1, there is a sudden and complete convergence while 0 implies no meeting after experiencing the shock. The goodness of fit of the model can be checked through post-diagnostic test like serial correlation, functional form, normality test, heteroskedasticity and stability test such as Cumulative sum of Recursive Residuals (CUSUM) and Cumulative Sum of squares of Recursive Residuals (CUSUMSQ).

Results and Discussions

3.0 Descriptive properties of the variables

The attributes of the data used in this analysis are described in table 3.1 below giving hints on the mean, median, standard deviation, skewness as well as the Jarque-Bera statistics of each variable used in the model. The claim of the variables being relevant in this study is corroborated by the validity of the mean, Median including the minimum and maximum. The variables are normally distributed as indicated by the Jarque-Bera statistic. Supportively, the mean of the variables as observed from the table are not too different from their respective median values excluding Gbd. This is an indication of no extreme outliers and hence, making the variables stable for analysis. The value of standard deviation of each variable is a claim of the variables advancing towards normal distribution. Moreover, the skewness, Kurtosis and Standard deviation statistics denotes that the differences in the variables are not too significant. The properties of these variables are capable of inducing the validity or otherwise of REH in Nigeria and its significance as can be depicted below:

Table 3.1 Summary of Descriptive Statistics

	LNPRC	LNDY	LNGEXP	LNDB	GBD
Mean	5.5934	7.6022	3.4011	6.7668	-21908
Median	5.4625	8.3211	2.7229	7.0516	-66190
Maximum	6.2699	10.6590	5.6336	9.0867	56500
Minimum	4.8812	3.3216	0.7828	2.2373	-11755
Std. Dev	0.4126	2.3405	1.2281	1.8930	35629
Skewness	0.2095	-0.4398	0.8589	-0.7375	-1.8078
Kurtosis	1.7058	1.8747	2.1567	2.3316	4.7262
Jarque-Bera	10.1777	11.2199	20.1423	14.4234	88.2908
Probability	0.0062	0.0037	0.0000	0.0007	0.0000
Sum	738.324	1003.495	448.948	893.222	-28918
Sum Sq. Dev	22.3039	717.64	197.59	469.433	1.6600
Observations	132	132	132	132	132

Source: Authors' extract from Eviews 9, 2016.

Note: Where LNPRC= log of private consumption expenditure proxied by final consumption expenditure, LNDY= log of Disposable income proxied by the income or output after tax might have been deducted (Y-T), LNGEXP= log of Government expenditure proxied by final government consumption expenditure, LNDB= log of Government debt proxied by the difference between external and domestic debts outstanding and GBD= Government budget deficit proxied by the difference between government revenue and expenditure over the period of the study.

3.1 Unit Root Test

The unit root tests were conducted on all the variables to affirm their level of stationarity using the standard Augmented Dickey Fuller (ADF) test. The study used Schwarz Bayesian Information Criterion (SBC) at 5% level of significance since it performs better than other information criteria because it use the smaller lag length and hence produces the most parsimonious model. The unit root test is applied on the variables to ensure that none of the series is I (2) or integrated of higher order. The ADF-unit root test used maximum lag length 2 determined by SBC as seen from appendix 1.

Table 3.2 ADF Unit Root Results

Var	Log-levels			First difference			Deterministic	Order of integ.I(d)
	ADF-t stat.	Critical Val. (5%)	P-Val.	ADF-t stat.	Critical Val. (5%)	P-Val.		
LnPrc	-2.4035	-3.4458	0.1009	-4.1239	-2.8844	0.0022	Intercept	I(1)
LnDy	-0.0122	-2.8844	0.558	-3.8920	-3.4483	0.0448	Intercept & trend	I(1)
Lngexp	-1.0313	-3.4444	0.6303	-8.2349	-0.28837	0.0000	Intercept	I(1)
lnDb	-1.1204	-2.8844	0.3991	-5.5180	-2.8844	0.0072	Intercept	I(1)
Gbd	-1.005	-3.4458	0.7306	-4.0632	-2.8844	0.0031	Intercept	I(1)

Source: Authors' own computation from Eviews 9, 2016.

Note: All variables are in log form except Government budget deficit due to negative numbers in the series.

From the ADF unit root test in table 3.2 above, all the variables became stationary after the first difference. This implies that, Private final consumption expenditure, Disposable income, Government final consumption expenditure, Government debt and Government budget deficit are integrated of order one (i.e.I (1)) at 5% level of significance. The unit root results fulfilled the underlying assumptions that necessitate the use of ARDL-bound test to affirm if long-run associations exist among the variables in Nigeria as extracted from Pesaran et al. (2001) procedure.

3.3 ARDL bound test for cointegration

The result of the bound test generated from the Cointegrating relationship is compared with the critical bound values determined by Pesaran et al. (2001) at 5% level of significance.

Table 3.3 ARDL-bound test for cointegration

T-statistic	Value	K	Level of sig.	Bound critical value	
				I(0)	I(1)
	4.6102	4	10%	2.45	3.52
F-Statistic.	4.6102	4	5%	2.86	4.01
	4.6102	4	1%	3.74	5.06

Source: Authors' computation from Eviews 9, 2016.

As observed from table 3.3 above, the computed F-statistics is 4.6102 while the lower and upper bounds are 2.86 and 4.01 respectively. Since the F-statistic calculated is greater than the upper bound of the critical value at 5% (/4.61/ > /4.01/), the null hypothesis of no cointegration moving from Dy, Gexp, Db and Gbd to Prc should be rejected. It can be concluded by this empirical findings that, long-run relationship exist among the variables which informed an investigation of the long-run marginal influence of the independent variables on the dependent variable. Since the ARDL technique assumes that the Cointegrating space is unity, it become expedient to ascertain if the regressors from I(1) are long-run enforcing.

The next stage is to estimate the coefficients of the long-run relations and the accompanying error correction model (ECM) using ARDL procedure. The optimal lags on the variables as chosen by SBC gave rise to the model ARDL (2, 1, 1, 0, 2). The estimated coefficients of the long-run association are as shown in Table 3.4:

Table 3.4 Estimated long-run coefficients based on ARDL (2, 1, 1, 0, 2) decided by SBC with lnPrc as the dependent variable

Variable	Coefficient	t-statistic	P-Value
C	8.35791	46.15543	0.0000
lnDy	0.340912	3.039762	0.0002
LnGexp	0.05610	2.291780	0.0391
lnDb	0.29420	4.238709	0.0023
Gbd	-2.102873	-3.027856	0.0011

Source: Authors' Compilation from Eviews 9, 2016.

The long-run coefficients from table 3.4 can be expressed using equation as:

*lnPrc = 8.35791+ 0.340912*lnDy + 0.05610*lnGexp -0.29420*lnDb - 2.102873*Gbd*

The computed coefficients of the long-run relationship using equation 2.4 shows that, disposable income proxied by the difference between national output and tax (Y-TX) has a positive and significant relationship with private final consumption expenditure. By implication, any 1percent increase in disposable income leads to a 0.34 percent rise in private consumption contravening the proposition laid in REH framework. This describes Nigerian consumers operating in an imperfect capital market conforming to the result of Oseni and Olomola (2013). Regarding the relationship between governments final consumption expenditure and private consumption, government final consumption expenditure (0.05610) have a positive and significant association with private consumption. This means that, holding other variables constant, any 1 percent rise in government final consumption expenditure lead to a 0.056 percent increase in private consumption. The positive relationship flouted the validity of REH and thus supported the efficacy of fiscal policy in Nigeria as corroborated by the study of Likita, (2014); Sunge, Shylet and Simion (2015).

On the other hand, government debt has a positive and significant impact on private consumption expenditure. This implies that, when there is an increase in government debt by 1 percent, private consumption also increase by 0.294 percent. This means that, increase in government bonds is considered as net wealth by Nigerian consumers. Thus, money realized from the bonds are not saved against the anticipated tax that shall be used in servicing the borrowed funds. Ricardian Equivalence Hypothesis to this end is vehemently refuted and fiscal policy supported in Nigeria. And government budget deficit negatively and significantly influenced private consumption expenditure in Nigeria. The estimated results exhibits that, a 1 percent fall or rise in government budget deficit leads to a 2.103 percent rise or fall in private consumption expenditure.

The impact government budget deficit have on private household consumption is dominant in the long-run explaining volume about Nigeria's gross mismanagement and misappropriation of public funds, weak sectoral linkages and lack of harmonized and well-coordinated fiscal and monetary policies (Ogbole, Amadi&Essi, 2011). Keeping in line with these results, increase in deficit is not fully put up by private savings for specific spending, thus, REH failed to hold in Nigeria. As a result, increase in budget deficit stimulates the need for external financing which always stir the twin deficit phenomenon in Nigeria. These results concurred to the conclusion reported by Kazmi (1991, 1992); Saeed and Khan (2011) rejecting REH in Pakistan.

3.4 Dynamics of short-run Error correction results.

Since all the variables are cointegrated after the first difference, there is need to restore any seeming deviation that may affect the model in its drive to equilibrium in order to test the joint significance of the variables. In selecting the short-run dynamics of the ARDL error correction model, the lag structure using SBC model criterion have been utilized during the Ordinary Least Square (OLS) estimation of the bounds tests. The results are as shown in table 3.5.

Table 3.5 Error correction representation for ARDL (2, 1, 1, 0, 2) model with lnPrc as dependent variable.

Variable	Coefficient	t-statistic	P-value
D(lnPrc(-1))	0.472139	6.221772	0.00000
D(lnDy)	-0.164403	-2.489104	0.0142
D(lnGexp)	-0.047402	-2.793323	0.0061
D(lnDb)	0.008764	0.765838	0.4453
D(Gbd)	-0.000001	-6.509101	0.0000
D(Gbd(-1))	0.0000000	4.510705	0.0000
ECM(-1)	-0.044231	-2.373667	0.0192

R^2=0.9905 Durbin-Watson = 2.0066 Prob. (F-stat) =0.000000
Adjusted R^2=0.9897 F-statistic =1251.223

Source: Researcher's computation from Eviews 9, 2016.

*Ecm = lnPrc + 0.0132*lnDy + 0.0224*lnGexp + 0.1982*lnDb - 0.0000*Gbd + 4.4985*c*

The short-run adjustment process appraised by the error correction model demonstrated how swift variables respond to shock and reverse to equilibrium. The coefficient estimate for the ECM_{t-1} (-0.044231) is negative and statistically significant (-2.373667) indicating that, deviations from private consumption expenditure is restored by 4% over the next quarter in Nigeria. The statistical significance of the error correction term reaffirm the presence of long-run association between private consumption and disposable income, government final consumption expenditure, government debt and government budget deficit.

This result submits that, the speed of adjustment to long-run shocks is significant but relatively weak. The coefficient of determination R^2 (0.9905) explains the joint influence of the explanatory variables in accounting for the change in the dependent variable (private consumption expenditure). Thus, 99 percent change in private consumption is as deduced by the variation in the explanatory variables. The F-statistic (1251.223) is greater than 5% and whose probability (0.000000) is significant and robust in explaining the reliability of the model. More remarkably, the Durbin-Watson statistic (2.0066) is greater than the coefficient of determination R^2 (0.9905) indicating that, there is no serial correlation in the model decided.

To reaffirm further whether REH holds in Nigeria, the restrictions $\theta_2 + \theta_4 = 0,\ \theta_5 = 0$, and $\theta_3 < 0$ from equation 2.3 have to be tested using the Wald standard test as seen below.

Table 3.6 Wald coefficient Standard test result

Test statistic	Null Hypothesis $\theta_2 + \theta_4 = 0,\ \theta_5 = 0,\ \theta_3 < 0$			Pesaran F-statistic C1(iii) Lower Bounds I(0)	Upper Bounds I(1)
	Value	Df	Probability		
F-stat.	2.48725	(4, 119)	0.0000		
X^2-stat.	69.94903	4	0.0000	2.86	4.01

Source: Author's computation from Eviews 9, 2016.

The result of the F-calculated (2.48725) appraised by the Wald-litmus test fall below the lower bounds (2.86) of Pesaran et al. (2001) critical table C1(iii). Hence, the null hypothesis of disposable income plus government budget deficit being equal to zero, government debt equal to zero and government consumption expenditure less than zero should not be rejected. By inference, the concern variables in the restriction are all I (0) process which counteracted the validity of REH in Nigeria using high frequency data from 1985Q1 to 2014Q4.

3.5 Post-diagnostic test

The goodness of fit and sensitivity of the Lagrange Multiplier (LM) test for serial correlation, heteroskedasticity, Normality test and Ramsey Regression Specification Error Test (RESET) as represented in table 3.7 below is undertaken to ascertain the correctness and stability of the model as well as its robustness.

Table 3.7 Post-diagnostic test

LM t-statistic	Chi Statistic (X^2)	Probability
Serial correlation (*)	1.274005	0.5289
Heteroscedasticity (**)	13.15370	0.7145
Normality test (***)	J-B(3.219400)	0.6435
Functional Form (****)	F-stat. (1, 118) 0.33799	0.5621

Note: Where (*), (**) and (***) (****) describes Breusch-Godfrey LM test for serial correlation, Breusch-Pagan Godfrey heteroskedasticity test, Jarque-Bera Normality test and Ramsey RESET test for omitted variables.

Source: Author's owned compilation using Eviews 9, 2016.

The robustness test of the model affirmed that, Breusch-Godfrey serial correlation LM test, Heteroskedasticity test, Jarque-Bera Normality test and Ramsey RESET specification test had correct functional form and the model's residuals were serially unrelated, normally distributed and homoskedastic. Also, the parameter stability justified by CUSUM and CUSUMSQ statistic suggests absence of instability in the coefficients since the plots of the two statistics radiated within the 5% critical bounds related to the parameter stability. The CUSUM and CUSUMSQ statistics and the Jarque-Bera Normality test are represented in appendix 3 and 4 respectively.

4 CONCLUSION

This research has provided a reliable evidence on testing if Ricardian Equivalence Hypothesis holds in Nigeria. The standard reduced-consumption function of Perelman and Pestieau (1993) was estimated using Autoregressive Distributed lag (ARDL) bound test developed by Pesaran et al. (2001) with little modification to assess how consumers treat government debt in terms of net wealth over the period 1985Q1 to 2014Q4. The study concluded that, REH does not hold in Nigeria because debt is considered as net wealth and consumers neither live forever nor treat their future generation as much as they care about themselves. Equally, REH proposition has been invalidated by the standard Wald test that, capital markets are imperfect due to borrowing constraints, hence private and public sectors have varied planning horizons with distortionary tax. To this effect, the study recommend Government to embark on a more prudent and proactive approach that can retain certain proportion of the revenue via fiscal policy rule. Fiscal policy rule can make sense in Nigeria by indoctrinating the tradition of fiscal discipline capable of committing government into taking certain level of conduct in fiscal and budgetary management; initiating and building government credibility in fiscal management over time and promoting strong fiscal discipline across all tiers of government.

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APPENDICES

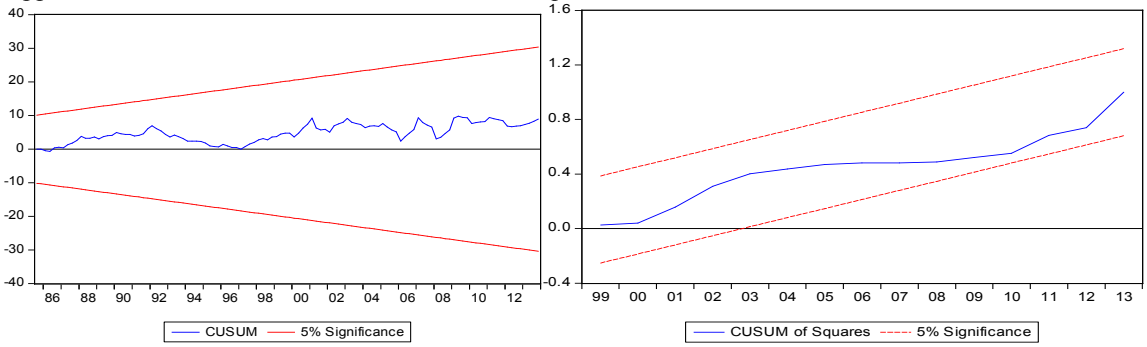
Appendix 1: Optimal Lag Selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-2146.760	NA	8.13e+08	34.70580	34.81952	34.75200
1	-994.1075	2193.757	10.26619	16.51786	17.20019	16.79504
2	-897.4931	176.0876	3.240554	15.36279	16.61372*	15.87095*
3	-890.7348	11.77246	4.370430	15.65701	17.47655	16.39615
4	-886.2257	7.490964	6.138628	15.98751	18.37565	16.95763
5	-804.7269	128.8207	2.505329	15.07624	18.03299	16.27734
6	-746.9804	86.61977*	1.511063*	14.54807*	18.07342	15.98015
7	-739.8032	10.18703	2.079461	14.83553	18.92949	16.49860
8	-732.8621	9.292086	2.905180	15.12681	19.78937	17.02085

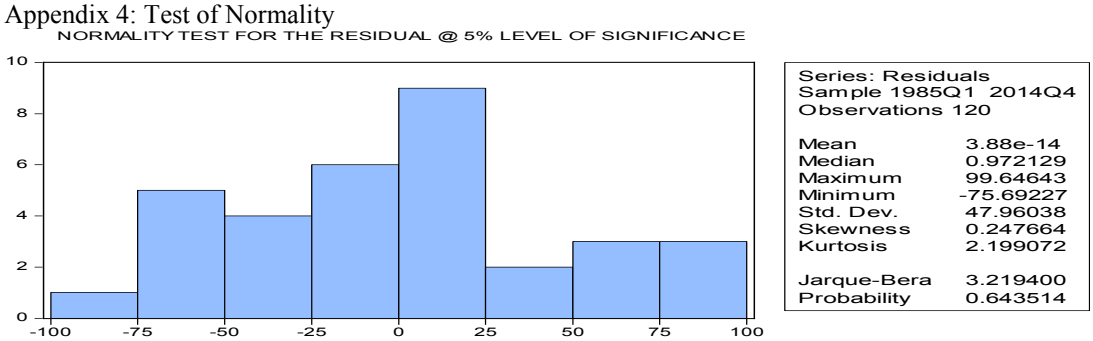
Appendix 2: Wald-Test

Test Statistic	Value	Df	Probability
F-statistic	2.48726	(4, 119)	0.0000
Chi-square	69.94903	4	0.0000

Appendix 3: Plots of cumulative sum and sum of square of recursive residual



Appendix 4: Test of Normality



Appendix 5 : Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.924704	Prob. F(14,115)	0.5348
Obs*R-squared	13.15370	Prob. Chi-Square(14)	0.7145
Scaled explained SS	42.67644	Prob. Chi-Square(14)	0.0001

Appendix 6: Ramsey Reset Test

Specification: LNPRC LNPRC(-1) LNPRC(-2) LNGEXP LNGEXP(-1) LNDY LNDY(-1) LNDB GBD GBD(-1) GBD(-2) C

Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	0.581374	118	0.5621
F-statistic	0.337995	(1, 118)	0.5621

Appendix 7: Breusch-Godfrey Serial Correllation Lm Tests

F-statistic	0.454542	Prob. F(2,89)	0.6362
Obs*R-squared	1.274005	Prob. Chi-Square(2)	0.5289