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Determinants of Government Size in Nigeria: A Test of Wagner's Hypothesis

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Abstract

This study investigates the determinants of government Size in Nigeria by disaggregating the total expenditure into functional categories of government expenditure, using annual time series data for a period of 62 years (1961-2023). Also, unit root properties of the variables using Augmented Dickey Fuller (ADF) was carried out to examine the stationary nature of each of the variable used in the models of this study, and the results indicate that most of the variables were stationary at level while others at first difference. The results of the cointegration tests reveals that the F-statistic values of the tests are greater than both I(0) and I(1) critical value bounds at 5% level of significance in most of the tests which is a condition for rejecting the null hypothesis of no long run relation among the variables of each equation. The study further employs Autoregressive Distributive Lag (ARDL) model. The study also, carries out a review of those theories that had formed the basis of previous empirical studies such Wagner's Law. The study found that total revenue, aggregate income, per capital income, revenue per capita and population contribute to the expansion of the size of government expenditure while civilian regime dummy variable indicates that the size of government is lower during civilian era than during a military regime in all estimations; election year is not associated with higher government expenditure and no any effect in government administration. The result also find positive and negative effects of all expressions of revenue and fiscal deficit on the government size. The study therefore, recommends that regulatory authorities should realize the inevitability of the need for additional governmental services that would be demand-driven; the policy makers or regulatory authorities need to understand when the expenditure is overblown so as to take appropriate measures as a corrective action. Finally, population reduction programme or legislation is required in the country in order to curtail the size of government expenditure.

Keywords: *ARDL, Government Size, income, per capita income, functional categories*

JEL classification: 01, E62

1. Introduction

The researchers have paid more attention on the determinants of government size due to the increase in public spending. The study that first observed the increasing public spending was Adolph Wagner (1893) and this phenomenon has received considerable attention from economists and practitioners of public finance over the years. Wagner investigated the general causes for a rising trend in government expenditures and discussed the major reasons why the rate of growth of expenditures in a society is faster than the rate of growth of society output.

This study has been seen as an important research area particularly in the public finance. As pointed out by Hafeez, Rehman and Mashood (2007), the relative size of public sector has revealed promising growth in both developing and developed countries of the world. According to the study, after the World War II, every country was eager to achieve rapid economic growth and a sharp increase in public spending, as well as in GDP, for the the past few decades. For this reasons, several attempts have been made to test for the validity of Wagner's Law to explain the size of government or reasons for the increase in government spending by employing several models and propositions by different empirical studies. Both in theory and empirical literature, the determinants of government size have been treated extensively. The theoretical foundation of this can be traced as far back as of the time of Wagner (1893), Keynes (1936), Peacock and Wiseman (1961) and later to Musgrave (1969).

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Recent studies have used different econometric models both in theory and empirical analyses in explaining the causes of the increase in public expenditure but most of the models for the analysis are problematic and not consistent, particularly for developing countries. This study is unique in identifying factors that are responsible for determining government expenditure based on economic categories of government expenditure, using Nigerian data.

In order to investigate the determinants of government expenditure, the study uses the functional categories of total government expenditure to see what factors could explain their secular movements over the decades in Nigeria. For this purpose, the total expenditure is analyzed into four categories, viz: administration, economic services, social and community services and transfers expenditures. as the dependent variables for the functional category of government expenditure in Nigeria to analyse the results. The rest of this paper is structured as follows. Section 2 contains a statement of the research problem. Section 3 is devoted to theoretical framework and empirical literature. Section 4 is materials and methods while Section 5 presents the discussion of the results. Finally, Section 6 devoted to conclusion and recommendations.

2. Statement of the Research Problem

This study finds it necessary to investigate the determinants of government expenditure in Nigeria due to the persistence increase in public spending to government budget. Consequent upon this, a lot of studies have developed interest in investigating the causes or determinants of government expenditure, using different proxy variables and different econometric methodologies both from developed and developing countries to investigate the subject matter but there are considerable variations in the empirical results from these studies.

In the case of Nigeria, Public spending have been growing continuously over the years and more especially in the last two decades because of the role of government in economic activities which has grown enormously and the policymakers face a lot of challenges day by day. It becomes more necessary for National Assembly to be aware when the expenditure is over blown and the causes in order to help them in their oversight functions.

However, in a developing country like Nigeria, the studies that have explained the observed rising public expenditures and the causes are very few while majority of them are deficient in one aspect or the other. Henrekson (1992) opines that, to investigate the determinants of government expenditure, it is better to employ time series behaviour of public expenditure in a country for as long a period as possible instead of using a cross-section of countries at different income levels as a number of previous studies have done.

The basic idea behind this assertion is that government spending profile and priorities tend to differ from one country to another. Therefore, it will be more robust to consider a specific country of study in order to provide a useful policy insight regarding the determinants of government size in a particular developing economy, like Nigeria. Also, it is noted that most of the existing studies measure government size by using total expenditure instead of disaggregating the expenditure into different components in order to obtain a more robust insight. It is in this sense that Jagannath (2013) argues that it is not the volume but the structure or component of public expenditure matters for output and growth of an economy. Thus, using disaggregation method will provide a greater insight. Related to this is the issue of whether the level of income initially exerts a positive effect on the size of government up to a threshold income level, beyond which it starts to have a negative effect on the size of government, a proposition that has not been much tested in the literature.

It is the quest to address those afore-mentioned gaps and challenges that therefore provides the impetus for the present study.

3. Theoretical Framework/Empirical Literature

The theoretical framework of this study anchored on the theory of Wagner's Law. But in the main, it is the explanatory variable (viz: income level) suggested by Wagner that provides the most core variable employed in explaining the government size in most of the models estimated in the study. A German political economist, Adolph Wagner (1893) developed a "law of increasing state activity" in Western Europe, after empirical analysis of the situation at the end of the 19th century. He opines that government growth is a function of increased industrialization and economic development. Wagner explains that, as the real income per capita of a nation increases, the share of public expenditures in the total expenditures increases, during the industrialization process. The advent of modern industrial society will result in increasing political pressure for social progress and increased allowance for social consideration by industry (Guandong, 2016 : 243).

The empirical evidence on the determinants of government expenditures for both developed and developing countries, including Nigeria show different results. For instance, Kuang Y. N., Shamzaeffa S., Zalina Z. & Haitian W. (2025) investigate the determinants of government size in Malaysia during the periods of year 1980 to year 2018 using ARDL model. The variables included are trade openness, country size, foreign direct investment openness, portfolio investment openness and the economic growth. The study found that there are long-run negative relationship significantly between the determinants such as trade openness, country size, foreign direct investment openness and portfolio investment openness with the government size. On the other hands, the economic growth has a significant positive long-run relationship with the government size in Malaysia. The study further shows that Both trade openness and economic growth variables have the Granger Causality effects towards the government size variable. The study thus recommends that government should maintain a balanced allocation of both operating and

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development expenditures, taking into account key influencing factors, to support sustainable long-term economic growth in Malaysia.

Krieger, Tim; Meierrieks & Daniel (2020) examine the effect of population size on government size for a panel of 130 countries for the period between 1970 and 2014. We show that previous analyses of the nexus between population size and government size are incorrectly specified and fail to consider the influence of cross

sectional dependence, non-stationarity and cointegration. Using a panel time-series approach that adequately accounts for these issues, we find that population size has a positive long-run effect on government size. This finding suggests that effects of population size that increase government size (primarily due to the costs of heterogeneity, congestion, crime and conflict) dominate effects that reduce government size (primarily due to scale economies

Daniel (2013) provides an empirical analysis of the long run implications of trade openness, foreign aid and democracy for the fulfillment of Wagner's law in the West African Monetary Zone (WAMZ), using panel data techniques and annual data for the period 1980-2008. The results clearly indicate that once trade openness, foreign aid and democracy have been catered for, Wagner's law becomes a reality for WAMZ countries. The result reveals that, per capita income, foreign aid and democracy have the potential to increase the size of the public sector in WAMZ countries in the long run. This paper therefore, finds evidence that income has a serious effect on government expenditure but not specified stages of income.

Wosowei Elizabeth (2013) carried out to determine the relationship between fiscal deficit and macroeconomic performance in Nigeria over the period 1980 to 2010.employed the Ordinary Least Square in estimating the equation. Preliminary test of stationarity and co integration of variables using the Augmented Dickey Fuller (ADF) test and the co integration test using the Engle Granger procedure were conducted respectively. However, the empirical findings showed that fiscal deficits even though that it met the economic a prior in terms of its negative coefficients yet, did not significantly affect macroeconomic output. The result also show a bilateral causality relationship between government deficit and gross domestic product, government tax, and unemployment, while there is an independent relationship between government deficit and government expenditure and inflation. Based on these findings, the study recommends that government should minimize the level of deficit e.g by borrowing less for effective control of inflation rate in Nigeria. The need arises because increase in fiscal deficit increases money supply which negatively affects output growth.

In contrast, the study of Ali and Shah (2012) who empirically examine government revenue and expenditure nexus using annual data spanning from 1976 to 2009 in testing hypothesis in the case of Pakistan by employing the Granger causality techniques and Johansen co-integration, the study finds no relationship among the variables both in the long run and the short run.

Ogujiuba and Abraham (2012) also examine the revenue-spending hypothesis for Nigeria, using macro data from 1970 to 2011 and applying correlation analysis, Granger causality test, regression analysis, lag regression model, vector error correction model and impulse response analysis. The result reveals that causality runs from revenue to expenditure in Nigeria, and revenue and expenditure are highly correlated. The result of vector error correction model also reported that there is a significant long run relationship between revenue and expenditure.

Alfred and Mi (2010) investigate the determinants of government size at the provincial level in China for the period 1998–2006. The Study employs a provincial-level panel data set from mainland China. This study reports that there is absence of Wagner's law for China. Also, both revenue decentralization and expenditure decentralization contribute to the expansion of China's government. The result shows that both openness to trade and FDI have negative and significant coefficients and the estimated coefficients for real GDP per capita are negative and significant. Also, both expenditure decentralization and revenue decentralization have significant positive coefficients while the estimated coefficients for vertical imbalance are not significant. In addition, due to the relatively short duration chosen and the data for a cross-section of countries employed to investigate the public expenditure growth, the study may not be reliable. Nevertheless, the study has made a good step for its inclusion of important variables like GDP per capital but the evidence does not follow Musgrave propositions.

Furthermore, in the study of Shonchoy (2010) who conducts an empirical investigation on the pattern of government expenditure for developing countries and estimates the effects of possible determinants which may have influenced government expenditure, using a panel data set for 111 developing countries from 1984 to 2004. The study noted that political and institutional variables as well as governance variables significantly influence government expenditure. Among other results, the paper highlights evidence of Wagner's law which states that peoples' demand for services and willingness to pay are income-elastic and, hence, that the expansion of public economy is influenced by the greater economic affluence of a nation.

Also, in a Nigeria case, Clement and Dickson (2010), who disaggregated government expenditure in addition to total government expenditure, which covered the period of 1961-2007. Specifically, the government expenditure was disaggregated into expenditure on general administration and community and social services to see whether economic growth may have significant impacts on them while investigating if government expenditure pattern in Nigeria follows Wagner's law. The results indicate that long run relationship exists between the dependent and the independent variables except in the case where only GDP was used as the independent variable. It was reported that Wagner's

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hypothesis does not hold in all the estimations. In the causality test, none of the variables Granger-causes each other, meaning that, the variables are mutually independent. enditure.

Similarly, Hafeez, Rehman and Mashood (2007) examine the existence of Wagner's Law in Pakistan for the period of 1972–2004, employed Johansen and Juselius (1990) cointegration approach to investigate the long-run relationship between government expenditures and its determinants for Pakistan. The results confirmed a long-run relationship between government expenditures and the determinants such as per capita income, openness of Pakistan's economy, and the level of financial development.

In another related study, Vergue (2006) empirically examines which components of public expenditure are privileged by government in election time, using data on 42 developing countries covered the period of 26 years (1975-2001). The result reveals evidence of electoral impact on the allocation of public expenditure.

In the case of D-8 member countries (Bangladesh, Egypt, Indonesia, Iran, Malaysia, Nigeria, Pakistan and Turkey), Naved and Fareed (2005) who conducted an investigation on the determinants of government expenditure for the period 1973-2002. The study tests for the long-run relationship between government expenditure and per capita income using Musgrave (1969) specification. The study employs standard Granger procedure and standard cointegration technique, and the result rejects the presence of a long-run relationship between government size and per capita income for the D-8 member countries. The findings also reveal that, in the short-run, government size does not cause per capita income in the D-8 member countries, except a bi directional short-run causality between government size and per capita income was observed in Iran. Thus, Musgrave effect holds only in the case of Iran.

In contrast, Dhanasekaran (2001), who analyses the dynamics of causal relationship between revenue and expenditure in India used Granger-Sims causality tests covering the period of 1960 to 1996. The results shows no co-integration between government tax revenue and expenditure variables, implying an absence of evidence of a stable long run relationship between them.

4. Materials and Methods

This study noted the six popular variants of the Law that have been identified (see, Akitoby et al., 2006; Payne et al., 2006; Mohammadi, et. al. 2009) in explaining Wagner's Law. It was also observed by Kojo and Yemane (2013), different authors have used different mathematical forms for testing Wagner's law.

$$\ln G_t = \alpha_0 + \alpha_1 \ln Y_t + \varepsilon_{1t}, \text{ with } \alpha_1 > 1 \quad \ldots\ldots(1)$$

$$\ln\left(\frac{G}{Y}\right)_t = \beta_0 + \beta_1 \ln Y_t + \varepsilon_{2t}, \text{ with } \beta_1 > 0 \quad \ldots\ldots(2)$$

$$\ln G_t = w_0 + w_1 \ln\left(\frac{Y}{P}\right)_t + \varepsilon_{3t}, \text{ with } w_1 > 1 \quad \ldots\ldots(3)$$

$$\ln\left(\frac{G}{P}\right)_t = \psi_0 + \psi_1 \ln\left(\frac{Y}{P}\right)_t + \varepsilon_{4t}, \text{ with } \psi_1 > 1 \quad \ldots\ldots(4)$$

$$\ln\left(\frac{G}{Y}\right)_t = \delta_0 + \delta_1 \ln\left(\frac{Y}{P}\right)_t + \varepsilon_{5t}, \text{ with } \delta_1 > 1 \quad \ldots\ldots(5)$$

Wagner's Law is valid if the elasticity value in each of a, c, d and f exceeds unity and exceeds zero in each of b and e.

The above five equations will be estimated for this study as the reference simple regression equations so as to shed some light on any one that best fits Nigerian data, judging by the statistical significance and signs of the slope parameters of the estimated equations.

In order to investigate the determinants of government expenditure based on different functional categories as its practice and contains in Nigeria Central Bank Statistical bulletin, the total expenditure is analyzed into four categories, viz: administration, economic services, social and community services and transfers expenditures as the dependent variables using the basic estimations of Wagner's Law earlier specified, as follows:

The Five Variants of Government Administration Expenditure Equations

$$\ln ADM_t = \alpha_0 + \alpha_1 \ln Y_t + \alpha_2 \ln R_t + \alpha_3 \ln FD_t + \alpha_4 \ln P_t + \alpha_5 \ln URB_t + \alpha_6 \ln POLR_t + \alpha_7 \ln ELEC_t + \varepsilon_t \quad \ldots\ldots(6)$$

$$\ln\left(\frac{ADM}{Y}\right)_t = \beta_0 + \beta_1 \ln Y_t + \beta_2 \ln\left(\frac{R}{Y}\right)_t + \beta_3 \ln\left(\frac{FD}{Y}\right)_t + \beta_4 \ln P_t + \beta_5 \ln URB_t + \beta_6 \ln POLR_t + \beta_7 \ln ELEC_t + \varepsilon_t \quad \ldots(7)$$

$$\ln ADM_t = w_0 + w_1 \ln\left(\frac{Y}{P}\right)_t + w_2 \ln R_t + w_3 \ln FD_t + w_4 \ln P_t + w_5 \ln URB_t + w_6 \ln POLR_t + w_7 \ln ELEC_t + \varepsilon_t \quad \ldots(8)$$

$$\ln\frac{ADM}{P}_t = \psi_0 + \psi_1 \ln\left(\frac{Y}{P}\right)_t + \psi_2 \ln\frac{R}{P}_t + \psi_3 \ln\frac{FD}{P}_t + \psi_4 \ln P_t + \psi_5 \ln URB_t + \psi_6 \ln POLR_t + \psi_7 \ln ELEC_t + \varepsilon_t \quad \ldots\ldots(9)$$

$$\ln\frac{ADM}{Y}_t = \delta_0 + \delta_1 \ln\left(\frac{Y}{P}\right)_t + \delta_2 \ln\frac{R}{Y}_t + \delta_3 \ln\frac{FD}{Y}_t + \delta_4 \ln P_t + \delta_5 \ln URB_t + \delta_6 \ln POLR_t + \delta_7 \ln ELEC_t + \varepsilon_t \quad \ldots\ldots(10)$$

The Five Variants of Government Economic Services Expenditure Equations

$$\ln ECS_t = \alpha_0 + \alpha_1 \ln Y_t + \alpha_2 \ln R_t + \alpha_3 \ln FD_t + \alpha_4 \ln P_t + \alpha_5 \ln URB_t + \alpha_6 \ln POLR_t + \alpha_7 \ln ELEC_t + \varepsilon_t \quad \ldots\ldots(11)$$

$$\ln\left(\frac{ECS}{Y}\right)_t = \beta_0 + \beta_1 \ln Y_t + \beta_2 \ln\left(\frac{R}{Y}\right)_t + \beta_3 \ln\left(\frac{FD}{Y}\right)_t + \beta_4 \ln P_t + \beta_5 \ln URB_t + \beta_6 \ln POLR_t + \beta_7 \ln ELEC_t + \varepsilon_t \quad \ldots\ldots(12)$$

$$\ln ECS_t = w_0 + w_1 \ln\left(\frac{Y}{P}\right)_t + w_2 \ln R_t + w_3 \ln FD_t + w_4 \ln P_t + w_5 \ln URB_t + w_6 \ln POLR_t + w_7 \ln ELEC_t + \varepsilon_t \quad \ldots(13)$$

$$\ln\left(\frac{ECS}{P}\right)_t = \psi_0 + \psi_1 \ln\left(\frac{Y}{P}\right)_t + \psi_2 \ln\frac{R}{P}_t + \psi_3 \ln\frac{FD}{P}_t + \psi_4 \ln P_t + \psi_5 \ln URB_t + \psi_6 \ln POLR_t + \psi_7 \ln ELEC_t + \varepsilon_t \quad \ldots(14)$$

$$\ln\left(\frac{ECS}{Y}\right)_t = \delta_0 + \delta_1 \ln\left(\frac{Y}{P}\right)_t + \delta_2 \ln\frac{R}{Y}_t + \delta_3 \ln\frac{FD}{Y}_t + \delta_4 \ln P_t + \delta_5 \ln URB_t + \delta_6 \ln POLR_t + \delta_7 \ln ELEC_t + \varepsilon_t \quad \ldots(15)$$

The Five Variants of Government Social and Community Services Expenditure Equations

$$\ln SCS_t = \alpha_0 + \alpha_1 \ln Y_t + \alpha_2 \ln R_t + \alpha_3 \ln FD_t + \alpha_4 \ln P_t + \alpha_5 \ln URB_t + \alpha_6 \ln POLR_t + \alpha_7 \ln ELEC_t + \varepsilon_t \quad \ldots\ldots(16)$$

$$\ln\left(\frac{SCS}{Y}\right)_t = \beta_0 + \beta_1 \ln Y_t + \beta_2 \ln\left(\frac{R}{Y}\right)_t + \beta_3 \ln\left(\frac{FD}{Y}\right)_t + \beta_4 \ln P_t + \beta_5 \ln URB_t + \beta_6 \ln POLR_t + \beta_7 \ln ELEC_t + \varepsilon_t \quad \ldots(17)$$

$$\ln SCS_t = w_0 + w_1 \ln\left(\frac{Y}{P}\right)_t + w_2 \ln R_t + w_3 \ln FD_t + w_4 \ln P_t + w_5 \ln URB_t + w_6 \ln POLR_t + w_7 \ln ELEC_t + \varepsilon_t \quad \ldots(18)$$

$$\ln\left(\frac{SCS}{P}\right)_t = \psi_0 + \psi_1 \ln\left(\frac{Y}{P}\right)_t + \psi_2 \ln\frac{R}{P}_t + \psi_3 \ln\frac{FD}{P}_t + \psi_4 \ln P_t + \psi_5 \ln URB_t + \psi_6 \ln POLR_t + \psi_7 \ln ELEC_t + \varepsilon_t \quad \ldots(19)$$

$$\ln\left(\frac{SCS}{Y}\right)_t = \beta_0 + \beta_1 \ln Y_t + \beta_2 \ln\left(\frac{R}{Y}\right)_t + \beta_3 \ln\left(\frac{FD}{Y}\right)_t + \beta_4 \ln P_t + \beta_5 \ln URB_t + \beta_6 \ln POLR_t + \beta_7 \ln ELEC_t + \varepsilon_t \quad \ldots(20)$$

The Five Variants of Government Transfers Expenditure Equations

$$\ln TRANS_t = \alpha_0 + \alpha_1 \ln Y_t + \alpha_2 \ln R_t + \alpha_3 \ln FD_t + \alpha_4 \ln P_t + \alpha_5 \ln URB_t + \alpha_6 \ln POLR_t + \alpha_7 \ln ELEC_t + \varepsilon_t \quad \ldots\ldots(21)$$

$$\ln\left(\frac{TRANS}{Y}\right)_t = \beta_0 + \beta_1 \ln Y_t + \beta_2 \ln\left(\frac{R}{Y}\right)_t + \beta_3 \ln\left(\frac{FD}{Y}\right)_t + \beta_4 \ln P_t + \beta_5 \ln URB_t + \beta_6 \ln POLR_t + \beta_7 \ln ELEC_t + \varepsilon_t \quad \ldots\ldots(22)$$

$$\ln TRANS_t = w_0 + w_1 \ln\left(\frac{Y}{P}\right)_t + w_2 \ln R_t + w_3 \ln FD_t + w_4 \ln P_t + w_5 \ln URB_t + w_6 \ln POLR_t + w_7 \ln ELEC_t + \varepsilon_t \quad \ldots(23)$$

$$\ln\left(\frac{TRANS}{P}\right)_t = \psi_0 + \psi_1 \ln\left(\frac{Y}{P}\right)_t + \psi_2 \ln\frac{R}{P}_t + \psi_3 \ln\frac{FD}{P}_t + \psi_4 \ln P_t + \psi_5 \ln URB_t + \psi_6 \ln POLR_t + \psi_7 \ln ELEC_t + \varepsilon_t \quad \ldots\ldots(24)$$

$$\ln\left(\frac{TRANS}{Y}\right)_t = \beta_0 + \beta_1 \ln Y_t + \beta_2 \ln\left(\frac{R}{Y}\right)_t + \beta_3 \ln\left(\frac{FD}{Y}\right)_t + \beta_4 \ln P_t + \beta_5 \ln URB_t + \beta_6 \ln POLR_t + \beta_7 \ln ELEC_t + \varepsilon_t \quad \ldots(25)$$

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where:

G = aggregate real government expenditure, $\frac{G}{P}$ = per capita real government expenditure, $\frac{G}{Y}$ = the share of government expenditure in GDP, ADM = Administration expenditure, $\frac{ADM}{P}$ = Administration expenditure per capita, $\frac{ADM}{Y}$ = Administration expenditure as a ratio of GDP, ECS = Government economic services expenditure, $\frac{ECS}{P}$ = Government economic services expenditure per capita, $\frac{ECS}{Y}$ = Government economic services expenditure as a ratio of GDP, SCS = Government social and community service expenditure, $\frac{SCS}{P}$ = Government social and community service expenditure per capita, $\frac{SCS}{Y}$ = Government social and community service expenditure as a ratio of GDP, $TRANS$ = Government transfers expenditure, $\frac{TRANS}{P}$ = Government transfers expenditure per capita, $\frac{TRANS}{Y}$ = Government transfers expenditure as a ratio of GDP, Y = GDP as a proxy for national income, $\frac{Y}{P}$ = per capita income, R = total government revenue, FD = fiscal deficit, $\frac{R}{Y}$ = revenue as a ratio GDP, $\frac{R}{P}$ = per capita revenue, $\frac{FD}{P}$ = per capita fiscal deficit, $\frac{FD}{Y}$ = fiscal deficit as ratio of GDP, P= population size, $POLR$ = political regime, $ELEC$ = election year dummy, URB = degree of Urbanization, (α_0, β_0, w_0, ψ_0 and δ_0) = intercept terms, (α, β, w, ψ and δ) = coefficients of independents, t = time period and ε = error term.

5. Results and Discussion

Descriptive statistics

This Section presents the descriptive statistics of each variable utilized for this study and the distribution properties of the variables for the model

Table 5.1: Descriptive statistic results

Variable	Mean	Median	Maximum	Minimum	Std Dev	Coff. Of Var.
G	4,113.001	1,017.997	18,139.241	130,431	2,021.281	0.49
G/P	19.122	4.83	81.049	0.115	20,421	1..06
G/Y	12.205	3.45	51.513	0.023	30.420	2.49
R	4,282,540	275,967	18,470.130	390,270	5,686,551	1.32
FD	92,260	89.65	330,890	2.298	160,231	1.73
P	65,650	30,234	223, 804	1.432	39,704	0.60
Y	615,225	330,145	3,516.321	423,428	420,115	0.68
Y/P	1,214,622	656,784	1,596.641	125,696	559,882	0.46
URB	28.701	28.019	47.838	0.012	12.870	0.44
FD/P	62,001	24,003	1.478	0.074	16,000	0.16
FD/Y	36,000	10,000	0.094	0.001	11,843	0.33
R/P	12,122	5052	82.528	0.069	19,960	1.63
R/Y	68,010	10,022	5.252	0.021	21,800	0.32

Source: Author's Computation, 2025

Explanatory Notes: Standard deviation is the average deviation from arithmetic mean (square root of variance), coefficient of variation (CV) is the measurement of the variability in relation to mean (i.e. standard deviation divided by mean). The number of observation is 62 in all cases

Therefore, the standard deviation is not applicable here, the coefficient of variation (CV) is employed to rank or compare the variables due to their different in the unit of measurement. Accordingly, the variables with highest CV includes G/Y (2.49), FD (1.73), R/P (1.63), R (1.32), G/P (1.06), Y = (0.68) and P (60) while the variables with lowest includes G (0.49), Y/P (0.46), URB (44), FD/Y (0.33), R/Y (0.32) and FD/P (0.16). Note here that total government expenditure (G) was the only dependent variable used to avoid duplication of variants categories of government expenditures.

Correlation Analysis

Table 5.2 presents the pair-wise correlation coefficients of the relationship between each pair of variables with their respective p-values, showing the statistical significance of the coefficients. The study adopts 5% significance level (i.e 95% confidence level) as the cut-off so that a P-value higher than 5% is adjusted to mean that its associated correlation coefficient is not statistically significant and, hence that the two variables involved are not correlated.

Table 5.2: The Correlation Matrix

Variable	lnG	lnG/Y	lnG/P	lnY	lnR	lnFD	lnP	lnURB	lnR/P	lnFD/P	lnY/P	lnR/Y	lnFD/Y
lnG	1												
lnG/Y	0.646 (0.000)	1											

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lnG/P	0.798 (0.000)	0.771 (0.000)	1										
lnY	0.367 (0.005)	-0.472 (0.000)	-0.017 (900)	1									
lnR	0.833 (0.000)	0.368 (0.005)	0.502 (0.000)	0.513 (0.000)	1								
lnFD	-0.292 (0.030)	0.127 (0.355)	0.062 (0.650)	-0.492 (0.000)	-0.636 (0.000)	1							
lnP	0.630 (0.000)	0.078 (0.567)	0.036 (0.790)	0.632 (0.000)	0.735 (0.000)	-0.565 (0.000)	1						
lnURB	0.609 (0.000)	0.064 (0.638)	0.010 (0.937)	0.625 (0.000)	0.719 (0.000)	-0.559 (0.000)	0.998 (0.000)	1					
lnR/P	0.532 (0.000)	0.462 (0.000)	0.705 (0.000)	0.051 (0.708)	0.658 (0.000)	-0.303 (0.024)	0.025 (0.853)	0.047 (0.730)	1				
lnFD/P	-0.457 (0.001)	0.062 (0.652)	0.031 (0.820)	-0.603 (0.000)	-0.748 (0.000)	0.947 (0.000)	-0.799 (0.000)	-0.794 (0.000)	-0.211 (0.121)	1			
lnY/P	0.668 (0.000)	0.183 (0.179)	0.540 (0.000)	0.548 (0.000)	0.666 (0.000)	-0.366 (0.005)	0.413 (0.001)	0.379 (0.004)	0.525 (0.000)	-0.427 (0.001)	1		
lnR/Y	0.367 (0.005)	0.844 (0.000)	0.488 (0.000)	-0.604 (0.000)	0.371 (0.005)	-0.054 (0.694)	-0.019 (0.887)	-0.026 (0.000)	0.573 (0.000)	-0.031 (0.817)	-0.020 (0.879)	1	
lnFD/Y	-0.374 (0.004)	0.319 (0.017)	0.049 (0.719)	-0.821 (0.000)	-0.637 (0.000)	0.900 (0.000)	-0.686 (0.000)	-0.678 (0.000)	-0.224 (0.099)	0.921 (0.000)	-0.514 (0.000)	-0.266 (0.048)	1

Source: Author's Computation, 2025

Explanatory Notes: P-values of the correlation coefficients are in the parentheses. The correlation indicates existence of association if its P-value is not more than 5% cut-off.

As it can be seen from the correlation matrix, the results show that there is positive and negative coefficients of correlation of most of the variables while there is no correlation between lnURB and lnP, lnFD, and $\ln\frac{FD}{Y}$. It is noteworthy that some of these correlation coefficients are well below 0.8 while some are above 0.9. This implies that inclusion of those variables below 0.8 in a single regression model may not create problems of severe multicollinearity (Asteriou and Hall, 2016). The study also used total government expenditure and its variants in the same manner with Descriptive Statistic, instead of using all categories of government expenditure and their variants in order to avoid duplication

Unit Root Test

This section presents the unit root test, using the Augmented Dickey-Fuller procedure. The test was carried out to examine the stationary nature of each of the variable used in the models of this research work in order to avoid the consequence of having a spurious regression result.

Table 5.3: Augmented Dickey Fuller Unit Root Test for the Variables

Variables	Stationary	t-statistic	Crit. Val. at 5% level	P-value	Order of Integration	Conclusion
lnADM	At level	-5.448**	-2.916	0.000	Stationary	I(0)
lnADM/P	At level	-4.234**	-2.916	0.001	Stationary	I(0)
lnADM/Y	At level	-4.711**	-2.917	0.000	Stationary	I(0)
lnECS	At level	-2.358**	-2.917	0.159	Not Stationary	I(1)
	At First	-3.257**	-2.918	0.000	Stationary	

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	Diff.					
lnECS/P	At level	-2.243*	-2.917	0.194	Not Stationary	I(1)
	At First Diff.	-7.182**	-2.918	0.000	Stationary	
lnECS/Y	At level	-2.476*	-2.917	0.127	Not Stationary	I(1)
	At First Diff.	-7.341**	-2.918	0.000	Stationary	
lnSCS	At level	-2.206*	-2.917	0.207	Not Stationary	I(1)
	At First Diff.	-4.157**	-2.925	0.002	Stationary	
lnSCS/P	At level	-2.877*	-2.917	0.055	Not Stationary	I(1)
	At First Diff.	-4.139**	-2.925	0.002	Stationary	
lnSCS/Y	At level	-3.984**	-2.924	0.003	Stationary	I(0)
lnTRANS	At level	-2.703*	-2.917	0.080	Not Stationary	I(1)
	At First Diff.	-8.822**	-2.918	0.000	Stationary	
lnTRANS/P	At level	-2.941**	-2.917	0.048	Stationary	I(0)
lnTRANS/Y	At level	-2.929**	-2.917	0.050	Stationary	I(0)
lnY	At level	0.435*	-2.916	0.983	Not Stationary	I(1)
	At First Diff.	-4.586**	-2.918	0.001	Stationary	
lnY/P	At level	-1.586*	-2.918	0.483	Not Stationary	I(1)
	At First Diff.	-4.575**	-2.918	0.001	Stationary	
lnR	At level	-2.530*	-2.917	0.114	Not Stationary	I(1)
	At First Diff.	-8.044**	-2.918	0.000	Stationary	
lnR/P	At level	-2.968**	-2.917	0.044	Stationary	I(0)
lnR/Y	At level	-3.438**	-2.917	0.014	Stationary	I(0)
lnP	At level	-2.287*	-2.917	0.999	Not Stationary	I(1)
	At First Diff.	-6.033**	-2.918	0.000	Stationary	
lnURB	At level	-0.701*	-2.918	0.838	Not Stationary	I(1)
	At first Diff	-3.031**	-2.918	0.047	Stationary	
lnFD	At level	-3.544**	-2.917	0.010	Stationary	I(0)
lnFD/Y	At level	-5.897**	-2.921	0.000	Stationary	I(0)
lnFD/P	At level	-0.547*	-2.921	0.873	Not Stationary	I(1)
	At First Diff.	-6.165**	-2.921	0.000	Stationary	

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Source: Author's Computations, 2025

Explanatory Notes:* indicate rejection of the null hypothesis at the 5% level of significance (i.e. not significant at level) while ** indicates acceptance of the null hypothesis at the 5% level of significance using critical values from MacKinnon (1996).

The decision rule of ADF is to reject the null hypothesis that a variable has unit root (i.e. the variable is a non-stationary series) if p-value is less than the critical value at 5% significance level (or if t-statistic is greater than the 5% critical value) and accept null hypothesis if otherwise. The result clearly suggests a failure to reject null hypothesis at level for all variables i.e.

each of their t-statistics is lower than the critical values and their respective p-values are higher than 0.05. The only exceptions are $ln\frac{GC}{P}$, lnADM, $\ln\left(\frac{ADM}{P}\right)$, $\ln\left(\frac{ADM}{Y}\right)$, $\ln\left(\frac{SCS}{Y}\right)$, $\ln\left(\frac{TRANS}{P}\right)$, $\ln\left(\frac{TRANS}{Y}\right)$, $\ln\left(\frac{R}{P}\right)$, $\ln\left(\frac{R}{Y}\right)$, FD and $\ln\left(\frac{FD}{Y}\right)$ where their t-statistic values exceed the critical values that the null hypothesis of stationarity is accepted for them.

The implication of this result is that using Ordinary Least Squares (OLS) method to estimate the parameters will lead to a spurious regression results if there is no long run cointegration. This necessitates the test of cointegration to check if at all there is a long-run relationship among the non-stationary variables used in the model. Given the order of integration of these variables as pointed out in the above paragraph, , an appropriate technique to be used to conduct the cointegration test is the ARDL bound test approach to cointegration,

ARDL Bound Test Results

This section presents and discusses the results of the tests of cointegration for the variables in the different versions of models of the functional categories of government expenditure in order to verify if there exist long-run relationships among each equation and its explanatory variables. The decision rule is to accept the null hypothesis if the reported F-statistic value is below I(0) critical value (lower bound) (a condition to accept the null hypothesis of no long run relation among the variables of the models) and to reject it if the reported F-statistic value is above I(1) critical value (upper bound). But if the reported F-statistic value is within a bound of I(0) and I(1), the evidence would be inconclusive as to whether to accept or reject the null hypothesis (Pesaran, Shin & Smith, 2001).The result is evaluated at 5% significance level, implying that 5% level is taken to be the cut-off.

Table 5.4: Results of Cointegration Tests for all the Equations

	Administration Expenditure Equations 6 to 10		**Economic Services Expenditure Equations 11 to 15**		**Social and Community Services Expenditure Equations 16 to 20**		**Transfers Expenditure Equations 21 to 25**	
Critical bound Value	5%	F-stat	5%	F-stat	5%	F-stat	5%	F-stat
	Equation 6 for G		Equation 11 for G		Equation 16 for G		Equation 21 for G	
I(0)	2.32	6.89*	2.45	2.59***	2.32	6.59*	2.45	5.89*
I(1)	3.5		3.61		3.3.5		3.61	
	Equation 7 for G/Y		Equation 12 for G/Y		Equation 17 for G/Y		Equation 22 for G/Y	
I(0)	2.32	6.89*	2.45	1.97**	2.32	6.59*	2.45	5.89*
I(1)	3.5		3.61		3.35		3.61	
	Equation 8 for G		Equation 13 for G		Equation 18 for G		Equation 23 for G	
I(0)	2.32	6.79*	2.45	2.24**	2.45	5.02*	2.45	6.79*
I(1)	3.5		3.61		3.61		3.61	
	Equation 9 for G/P		Equation 14 for G/P		Equation 19 for G/P		Equation 24 for G/P	
I(0)	2.32	6.25*	2.32	2.92***	2.45	5.52*	2.45	5.24*
I(1)	3.5		3.3.5		3.61		3.61	

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	Equation 10 for G/Y		Equation 15 for G/Y		Equation 20 for G/Y		Equation 25 for G/Y	
I(0)	2.32	6.95*	2.32	4.36*	2.45	8.44*	2.45	7.47*
I(1)	3.5		3.3.5		3.61		3.61	

Source: Author's Computations, 2025

Explanatory Notes: I(0) and I(1) denote critical bound values to accept or reject the null hypothesis at 5% significance* denotes rejection of null hypothesis of no long-run,

Table 5.4 presents the cointegration which reveals that the F-statistic values of the tests are greater than both I(0) and I(1) critical value bounds at 5% level of significance in most of the tests which is a condition for rejecting the null hypothesis of no long run relation among the variables of each equation. The only exceptions are some of Economic Services Expenditure Equation 11 and 12, where the F-statistic value is also below I(1) critical value (a condition to accept the null hypothesis of no long run relation among the variables of the models) while in Equations 16 and 19, the F-statistic values fall within the critical value bounds, i.e. the result is inconclusive

As this implies that the variables of the equations have long run equilibrating relationship in all the estimations, the appropriate estimation technique is therefore the ARDL that will long-run coefficients. The study adopts the ARDL method for them because the method is versatile enough to be applicable to even when there is no such long-run relationship. Manning and Adriacanos (1993) opine that in the absence of a cointegraton relation between variables, it is still also necessary to investigate the short-run relationship between them. Aregbeyen (2006) also suggests that if there is no-long run relationship between the variables for a given period of time, the variables may still be causally related in the short run.Therefore, this study will subject those equations that failed cointegration test to shot-run ARDL test, it is allowed and the variables may still be causally related.

Regression Analysis

Having previously evaluated the ARDL bound test above, this section further utilizes ARDL estimation technique to examine the determinants of government size in Nigeria using functional categories as.

Estimates of the Functional Categories Expenditure Regression Equations

Following the discussion in Section 4, five variants of the equations are estimated for each of the four functional government expenditure categories and the results are as presented in Table 5.4 presents the long run coefficients of the ARDL estimates on the equations.

Some variables (viz: degree of urbanization, political regime and population) are omitted in different equations in order to reduce the incidence of multicollinearity due to observed high correlations among the effected variables, following the preliminary tests (through an examination of the correlation matrix) and the results of the VIF tests carried out.

Table 5.5: ARDL Long Run Estimates of the Equations for the Four Functional Categories of Government Expenditure

Estimates of the Equations 6 to 15 for the Government Administration Expenditure

	Equation 6 for ADM			Equation 7 for ADM/Y			Equation 8 for ADM			Equation 9 for ADM/P			Equation 10 for ADM/Y		
Varible	Coff.	t-stat.	Prob.	Coff.	t-stat.	Prob.	Coff.	t-stat.	Prob.	Coff.	t-stat.	Prob.	Coff.	t-stat.	Prob.
lnY	-3.383	-5.225	0.000	-3.825	-6.477	0.000	-	-	-	-	-	-	-	-	-
lnY/P	-	-	-	-	-	-	-4.766	-6.945	0.000	-5.269	-9.893	0.000	-4.7655	-6.945	0.000
lnR	1.17	-3.605	0.000	-	-	-	1.629	9.304	0.000	-	-	-	-	-	-
lnR/Y	-	-	-	1.353	9.379	0.000	-	-	-	-	-	-	1.629	9.304	0.000
lnR/P	-	-	-	-	-	-	-	-	-	1.007	4.412	0.000	-	-	-
lnFD	-0.874	4.745	0.001	-	-	-	-0.717	-5.352	0.000	-	-	-	-	-	-
lnFD/Y	-	-	-	-0.76	-6.8	0.000	-	-	-	-	-	-	-0.717	-5.352	0.000
lnFD/P	-	-	-	-	-	-	-	-	-	-0.848	-5.964	0.000			
lnP	25.001	3.924	0.000	30.706	5.047	0.000	25.52	4.824	0.000	30.795	5.409	0.000	25.519	4.824	0.000
lnURB	-26.734	-3.925	0.000	-37.679	-5.432	0.000	-31.261	-5.132	0.000	-37.2	-5.739	0.000	-31.261	-5.132	0.000
POLR	-1.260	-4.041	0.000	-0.737	-2.838	0.001	-1.576	-6.499	0.000	-0.375	-1.524	0.149	-1.576	-6.499	0.000
ELEC	0.259	1.303	0.202	-1.251	-2.248	0.007	0.399	1.802	0.000	-1.91	-3.23	0.006	0.399	1.802	0.090
C	-298.23	-3.429	0.001	-393.86	-4.761	0000	307.156	-4.367		360.406	-4.864	0.000	307.16	-4.366	0.000
D.W	2.084			2.65			2.395			2.605			2.390		
R-square	0.896			0.960			0.972			0.962			0.970		
Adj. R-square	0.789			0.900			0.913			0.867			0.910		
Prob.(F-Stat)	0.000			0.000			0.906			0.000			0.000		

Estimates of the Equations 11 to 12 for the Government Economic Services Expenditure

	Equation 11 for ECS	Equation 12 for ECS/Y	Equation 13 for ECS	Equation 14 for ECS/P	Equation 15 for G/Y		
Varible					Coff.	t-stat.	Prob.
lnY					-	-	-
lnY/P					-8.274	-5.823	0.000
lnR,					-	-	-
lnR/Y	Not applicable due to lack of evidence of cointegration. See Table 4.10a below for the equivalent short-run estimates	Not applicable due to lack of evidence of cointegration. See Table 4.10a below for the equivalent short-run estimates	Not applicable due to lack of evidence of cointegration. See Table 4.10a below for the equivalent short-run estimates	Not applicable due to lack of evidence of cointegration. See Table 4.10a below for the equivalent short-run estimates	0.767	3.066	0.006
lnR/P					-	-	-
lnFD					-	-	-
lnFD/Y					-1.107	3.79	0.001
lnFD/P							
lnP					68.43	6.977	0.000
lnURB					-80.568	-7.004	0.000
POLR					1.383	2.583	0.017
ELEC					-3.71	-2.918	0.008
C					-885	-7.026	0.000
D.W					2.500		
R-square					0.930		
Adj. R-square					0.840		
Prob.(F-Stat)							

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Source: Author's Computation, 2025

Explanatory Notes: In the table above, lnR, lnY, lnFD, lnP, lnURB, lnRP, lnYP, lnFDP, lnRY, lnFDY are natural logarithms of revenue, gross domestic product, fiscal deficit, population, degree of urbanization, per capita revenue, per capital income, per capita fiscal deficit, revenue in GDP and fiscal deficit in GDP . Others are political regime (POLR) and election year (ELEC) dummy variables. A parameter estimate is deemed to be statistically significant if its P-value is 0.05 or less.

Table 5.5 contd.: ARDL Long Run Estimates of the Equations for the Four Functional Categories Government Expenditure

Estimates of Equations 16 to 20 for the Social and Community Services Expenditure														
	Equation 16 for SCS			Equation 17 for SCS/Y			Equation 18 for SCS			Equation 19 for SCS/P			Equation 20 for SCS/Y		
Varible	Coff.	t-stat.	Prob.	Coff.	t-stat.	Prob.	Coff.	t-stat.	Prob.	Coff.	t-stat.	Prob.	Coff.	t-stat.	Prob.
lnY	-0.232	-0.826	0.421	0.366	0.913	0.375	-	-	-	-	-	-	-	-	-
lnY/P	-	-	-	-	-	-	1.18	3.647	0.001	1.504	4.777	0.000	1.77	2.96	0.005
lnR,	1.347	7.854	0.000	-	-	-	0.465	2.719	0.01	-	-	-	-	-	-
lnR/Y	-	-	-	1.346	7.854	0.000	-	-	-	-	-	-	1.072	4.56	0.000
lnR/P	-	-	-	-	-	-	-	-	-	0.322	0.044	2.13	-	-	-
lnFD	0.25	2.65	0.018	-	-	-	0.113	1.265	0.216	-	-	-	-	-	-
lnFD/Y	-	-	-	0.251	2.65	0.000	-	-	-	-	-	-	0.328	2.298	0.026
lnFD/P	-	-	-	-	-	-	-	-	-	0.059	0.758	0.455			
lnP	15.382	3.857	0.001	15.382	3.857	0.002	0.472	2.579	0.015	-0.096	-0.492	0.627	0.581	1.528	0.134
lnURB	-16.986	-3.919	0.001	-16.986	-3.919	0.001	-	-	-	-	-	-	-	-	-
POLR	-0.629	-2.177	0.045	-0.629	-2.17	0.046	0.343	1.864	0.072	0.610	2.039	0.053	0.04	0.153	0.879
ELEC	0.33	0.499	0.624	0.33	0.499	0.625	-0.58	-1.068	0.293	-1.263	-1.515	0.143	0.124	0.476	0.636
C	241.457	-4.454	0.000	241.46	-4.455	0.001	-19	-3.168	0.004	-19.819	-3.185	0.004	-40.152	-3.293	0.002
D.W	2.741			2.471			2.114			2.001			1.783		
R-square	0.971			0.943			0.842			0.888			0.736		
Adj. R-square	0.903			0.809			0.809			0.788			0.664		
Prob.(F-Stat)	0.000			0.000			0.000			0.000			0.000		
Estimates of the Equations 21 to 25 of Chapter 3 for the Transfers Expenditure															
	Equation 21 for TRANS			Equation 22 for TRANS/Y			Equation 23 for TRANS			Equation 24 for TRANS/P			Equation 25 for TRANS/Y		
Varible	Coff.	t-stat.	Prob.	Coff.	t-stat.	Prob.	Coff.	t-stat.	Prob.	Coff.	t-stat.	Prob.	Coff.	t-stat.	Prob.
lnY	-2.675	-1.923	0.063	-3.601	-2.277	0.030	-	-	-	-	-	-	-	-	-
lnY/P	-	-	-	-	-	-	1.475	1.379	0.183	-2.118	-1.172	0.250	-2.546	-1.486	0.147
lnR,	-0.015	-0.031	0.975	-	-	-	3.199	4.658	0.000	-	-	-	-	-	-
lnR/Y	-	-	-	-0.015	-0.032	0.975	-	-	-	-0.008	-0.012	0.99	-	-	-
lnR/P	-	-	-	-	-	-	-	-	-	-	-	-	0.029	0.971	0.339
lnFD	0.089	0.306	0.761	-	-	-	1.671	3.528	0.002	-	-	-	-	-	-
lnFD/Y	-	-	-	0.089	0.306	0.762	-	-	-	0.250	0.661	0.514	-	-	-
lnFD/P	-	-	-	-	-	-	-	-	-	-	-	-	0.337	0.048	0.961
lnP	59.486	2.75	0.010	59.487	2.75	0.010	-1.436	-0.113	0.911	39.646	2.13	0.041	32.866	2.022	0.052
lnURB	-64.625	-2.7355	0.010	-64.625	-2.736	0.010	1.415	0.097	0.923	-46.489	-2.115	0.042	-38.723	-2.028	0.051
POLR	-	-	-	-	-	-	-1.863	-4.529	0.000	-	-	-	-	-	-
ELEC	-7.785	-4.125	0/000	-7.785	-4.125	0.000	-82.3	-0.479	0.637	-5.638	-3.856	0.001	-4.728	-3.293	0.002
C	-812.897	-2.768	0.009	-812.9	-2.768	0.009	-82.3	-0.479	0.637	-545.4	-2.193	0.036	-441.36	-2.018	0.052
D.W	1.816			1.816			2.549			2.389			2.283		
R-square	0.852			0.825			0.827			0.835			0.835		
Adj. R-square	0.753			0.708			0.818			0.726			0.725		
Prob.(F-Stat)	0.000			0.000			0.000			0.000			0.000		

Source: Author's Computation, 2025

Explanatory Note: In the table above, lnR, lnY, lnFD, lnP, lnURB, lnRP, lnYP, lnFDP, lnRY, lnFDY are natural logarithms of revenue, gross domestic product, fiscal deficit, population, degree of urbanization, per capita revenue, per capital income, per capita fiscal deficit, revenue in GDP and fiscal deficit in GDP . Others are political regime (POLR) and election year (ELEC) dummy variables. A parameter estimate is deemed to be statistically significant if its P-value is 0.05 or less.

Table 5.6: Short-run ARDL Estimates of the Government Expenditure on Economic Services Equations without Evidence of Cointegration

Equation 11 for ECS				Equation 12 for ECS/Y				Equation 13 for ECS				Equation 14 for ECS/P			
Variable	Coefficient	t-Statistic	Prob.	Variable	Coeff.	t-Statistic	Prob.	Variable	Coeff.	t-Statistic	Prob.	Variable	Coeff.	t-Statistic	Prob.
D(LNFD)	0.248	2.216	0.032	D(LNY)	-1.606	-1.993	0.053	D(LNYP)	-2.764	-2.764	0.009	D(LNYP)	-7.030	-4.699	0.000
D(LNP)	11.603	1.705	0.096	D(LNFDY)	0.265	2.427	0.019	D(LNR)	4.363	4.363	0.000	D(LNYP(-1))	0.364	0.220	0.827
D(LNY)	-2.365	-2.445	0.019	D(LNRY)	0.960	4.939	0.000	D(ELEC)	0.702	0.702	0.486	D(LNYP(-2))	-2.870	-1.728	0.099
D(LNURB)	-13.038	-1.771	0.084	D(LNURB)	22.191	0.911	0.367	D(LNP)	0.997	0.997	0.325	D(LNYP(-3))	3.839	3.128	0.005
D(LNR)	0.759	3.670	0.000	D(LNURB(-1))	77.019	1.517	0.136	D(LNP(-1))	-0.049	-0.049	0.961	D(LNRP)	1.143	4.071	0.000
D(ELEC)	0.050	0.291	0.772	D(LNURB(-2))	-57.591	-2.282	0.027	D(LNP(-2))	-2.023	-2.023	0.050	D(LNRP(-1))	-0.173	-0.660	0.516
CointEq(-1)	-0.735	-4.768	0.000	D(POLR	-0.283	-1.298	0.201	D(LNP(-3))	2.039	2.039	0.049	D(LNRP(-2))	0.154	0.747	0.463
				D(ELEC)	0.216	1.181	0.244	D(LNFD)	2.784	2.784	0.008	D(LNRP(-3))	0.971	4.003	0.000
				CointEq(-1)	-0.509	-4.838	0.000	D(LNURB)	-2.263	-2.263	0.029	D(LNFDP)	-0.041	-0.323	0.749
								CointEq(-1)	-4.516	-4.516	0.000	D(LNFDP(-1))	0.402	2.970	0.007
												D(LNFDP(-2))	0.104	0.833	0.414
												D(LNFDP(-3))	0.750	4.304	0.000
												D(LNP)	80.415	2.759	0.012
												D(LNP(-1))	30.626	0.987	0.335
												D(LNP(-2))	-12.382	-0.345	0.733
												D(LNP(-3))	98.009	3.344	0.003
												D(LNURB)	-73.532	-5.561	0.000
												D(POLR)	-0.879	-2.559	0.018
												D(POLR(-1))	-0.357	-1.197	0.245
												D(ELEC)	-0.087	-0.319	0.753
												D(ELEC(-1))	0.906	2.629	0.016
												D(ELEC(-2))	0.537	1.714	0.101
												D(ELEC(-3))	1.013	3.589	0.001
												CointEq(-1)	-0.879	-5.411	0.000

Source: Author's Computation, 2025

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Explanatory Note: In the table above, lnR, lnY, lnFD, lnP, lnURB, lnRP, lnYP, lnFDP, lnRY, lnFDY are natural logarithms of revenue, gross domestic product, fiscal deficit,

population, degree of urbanization, per capita revenue, per capital income, per capita fiscal deficit, revenue in GDP and fiscal deficit in GDP . Others are political regime (POLR)

and election year (ELEC) dummy variables. A parameter estimate is deemed to be statistically significant if its P-value is 0.05 or less.

All the Tables above present the results of both long-run and short-run estimations of the determinants of functional categories of government expenditure: In government administration expenditure, both income and per capita income have negative effects on the size of government while the alternative expressions of government revenue and population size have positive effects on the size of government on government consumption expenditure in all the equations; the fiscal deficit and all its various concepts, degree of urbanization, civilian regime dummy variable have negative effects on government administration expenditure; dummy variable for the year of election has positive and negative effects on the size of government on aggregate and government administration government expenditure as a ratio of GDP. Coming to the findings for government economic services expenditure, both income and per capita income have strong positive effects and very week negative effect on the size of government on government economic services expenditure; the alternative expressions of government revenue and fiscal deficit have very strong positive effect on the size of government.; population size has positive effects in the two equations on the size of government. Dummy variable for the year of election and civilian regime dummy variable have very effect out of the three and four equations, each one of them feature and the degree of urbanization has negative effects on the size of government in three cases out of five equations. Next is the finding for government social and community services expenditure, that income and dummy variable for the year of election have no effect on the size of government while per capita income and degree of urbanization have negative effects on the size of government; the alternative expressions of government revenue, fiscal deficit and population have positive effects on government size on per capita government social and community services expenditure; civilian regime dummy variable, Civilian regime dummy variable, dummy variable for the year of election and degree of urbanization have negative effect and positive effect on per capita term. Finally, government transfers expenditure reveals that income has negative effects on the size of government while per capita income has no effect on government size in all the equations; the alternative expressions of government revenue and fiscal deficit have very week effects on the size of government on government transfers expenditure).

6. Conclusion and Recommendations

In order to achieve the objectives of this Study, the Wagner's theory was adopted, as its benchmark or basis. The explanatory variables employed in explaining each of the equations include different and alternative concepts of income, government revenue, government revenue per capita, government revenue as ratio of GDP, fiscal deficit per capita, fiscal deficit as ratio of GDP and population. Others are population size, the degree of urbanization, and dummy variables for the political regimes (viz: civilian versus military regimes) and election years.

The objective is to identify the determinants of various functional categories of government expenditure in Nigeria, with the associated research question being investigates the determinants of each functional category of government expenditure in Nigeria while the related research null hypothesis is that the various postulated determinants of the functional categories of government expenditure are actually not applicable to Nigerian data. The study has been able to accomplish this objective by showing that most of the variables used, influence government size with the exception of civilian regime dummy and dummy variable for election year on government administration expenditure; degree of urbanization, civilian regime dummy and dummy variable for election year on government economic services expenditure; dummy variable for election year on government social and community services expenditure and per capita income, alternative expressions of revenue and fiscal deficit on government transfers expenditure reported above. Accordingly, the research question has also been answered in the affirmative while the research null hypothesis has been contradcted.

In view of the evidence emanating from findings of ARDL, besides government transfers expenditure, the study is therefore recommending that the regulatory authorities, such as the National Assembly, should realize that as economy of a country improves or per capita income rises, there is tendency for government expenditure per capita to go up and this understanding will guide them in providing their oversight functions because there will be the need for additional governmental services that would be demand-driven. Also, based on the positive or negative effects of all expressions of revenue and fiscal deficit on the government size, the policy makers or regulatory authorities need to understand when the expenditure is overblown so as to take appropriate measures as a corrective action. Furthermore, the positive effect of population size on the size of government expenditure of various categories should serve as a guide to the policy makers or regulatory authorities concerning whether population reduction programme or legislation is required in the country in order to reduce the size of government expenditure.

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