DETERMINANTS OF GOVERNMENT SIZE IN NIGERIA: AN EMPIRICAL REVIEW

BY

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Abstract

The study examined the variables influencing the government size in Nigeria. A time series data concerning the period from 1981 to 2020 was used. The objective of the study was achieved through the use of the non-linear ARDL, ARDL, Hatemi J causality test and the Pesaran Shin and Smith (2001) and BDS tests. The result revealed that among the variables considered to investigate the major factor that determine government size, Gross domestic product, trade openness, inflation and oil revenue are major determinant of government size in Nigeria during the period of investigation. Hence, the study recommended that proper monitoring of oil revenue is important so as to ensure its judicious use in the economy and Government should also ensure price stability so as to allow free flow of investment to the country.

Introduction

In practically all economies today, the government undertakes the basic functions of allocation, stability, distribution, and regulation, particularly when the market proves inefficient or produces socially undesirable outcomes. Governments intervene to accomplish macroeconomic objectives such as economic growth and development, full employment, price stability, and poverty reduction, particularly in emerging nations. (Emefiele, Obim & Ita, 2019). Theoretically, both Keynesians and neoclassical economists proposed a variety of fiscal and monetary strategies and instruments for government intervention. The selection of a policy or instrument depends on its relative effectiveness in attaining the set of macroeconomic objectives, as demonstrated by theory or data. The argument over the use of fiscal policy to promote economic development and stabilize the economy is not new. The key issue in this debate often relates to the efficacy of public expenditure in stimulating economic growth. Other scholars have argued that it is economic growth that stimulates government expenditure. These two schools of thought bring to the fore the exact nature of the relationship between government expenditure and economic growth. On the one hand, Keynesian macroeconomics suggests that effective demand in an economy stimulated by an increase in government expenditure constitute the single most important policy instrument to improve economic growth. On the other hand, Adolph Wagner (1958) in the "law of the expanding state activity", postulates that it is economic growth that propels government expenditure.

Several scholars have carried out studies to justify the true nature of the relationship between these two key macroeconomic variables in different countries (Peacock & Wiseman, 1961; Solow, 1956; Barro, 1990). Some authors have opined that the increase in public spending may not necessarily stimulate economic growth because improvement in government spending may adversely affect the overall performance of the economy. This set of scholars argue that the government, in an effort to expand the size of public spending, may be compelled to either increase taxes or engage in borrowing. The policy to increase taxes may serve as a disincentive to work to the people and this may consequently have a negative impact on productivity. While engaging in borrowing may also predispose the country to a debt crisis and the attendance cost that goes into the servicing of the debt (Nwaogwugwu & Alenoghena, 2018). In addition, if the government borrows, private sector borrowing would be crowded out, which will have negative effects on economic growth and development. (Thilanka & Ranjith, 2018).

There have been different approaches to the measurement of the size of government. Gross Domestic Product is the most comprehensively used measure of economic performance. Its evolution through time represents the rate of economic expansion or performance. Comparing budget data to GDP provides a wealth of helpful information. Comparing government's expenditure or income to the size of the state's economy provides a measure of government size. Some have argued that the appropriate measure of changes in state spending assesses whether a given state can continue to provide existing services (Nwaogwugwu & Alenoghena, 2018). The ratio of government expenditures to the country's gross domestic product is an indicator for assessing the government's participation.

Government Size in Nigeria: Stylize Facts

Table 1: National Income and its Components in Nigeria

Components of National Income in Nigeria at Current Purchasers' Prices - Annual (₦' Billion)

Components	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Final Consumption Expenditure of Household	**36,452.43**	**41,437.72**	**42,115.91**	**58,745.85**	**64,334.92**	**74,410.95**	**83,218.22**	**91,599.98**	**98,392.13**	**106,502.96**
Final Consumption Expenditure of Non-Profits Serving Household	**224.48**	**248.79**	**278.57**	**302.25**	**336.34**	**374.73**	**416.93**	**465.15**	**483.22**	**523.44**
Final Consumption Expenditure of General Government	**4,832.15**	**5,412.01**	**5,953.21**	**5,796.44**	**5,826.89**	**5,648.95**	**5,522.95**	**5,059.38**	**7,234.46**	**8,575.35**
Individual Consumption Expenditure Of General Government	1,124.44	1,336.22	1,254.94	1,338.30	1,356.54	1,398.44	1,371.25	1,254.84	1,794.15	2,126.88
Collective Consumption Expenditure Of General Government	3,707.71	4,075.78	4,698.27	4,458.14	4,470.35	4,250.51	4,151.70	3,804.54	5,440.30	6,448.48
Changes In Inventories	**408.00**	**432.00**	**540.98**	**595.57**	**648.24**	**630.96**	**658.31**	**871.75**	**1,026.75**	**1,151.51**
Gross Fixed Capital Formation	**9,183.06**	**9,897.20**	**10,281.95**	**11,478.08**	**13,595.84**	**14,112.17**	**15,104.18**	**16,908.13**	**24,550.24**	**37,015.48**
Exports Of Goods And Services	**14,013.84**	**19,961.27**	**22,824.41**	**14,622.22**	**16,616.87**	**10,151.95**	**9,455.51**	**15,134.03**	**20,004.45**	**20,711.24**

Less Imports Of Goods And Services	9,644.61	13,675.63	9,395.40	10,530.45	11,222.12	10,151.98	11,800.70	15,139.17	22,604.34	**28,840.85**
Gross Domestic Product	55,469.35	63,713.36	72,599.63	81,0 09.96	90,136.98	95,177.74	102,575.42	114,899.25	129,086.91	**145,639.14**

Source: CBN Statistical Bulletin, 2020.

Table 2: National Income and its Components in Nigeria

Components of National Income in Nigeria at Current Purchasers' Prices as a percentage (%) of GDP

Components	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Final Consumption Expenditure of Household	65.72	65.04	58.01	72.52	71.37	78.18	81.13	79.72	76.22	**73.13**
Final Consumption Expenditure of Non-Profits Serving Household	0.40	0.39	0.38	0.37	0.37	0.39	0.41	0.40	0.37	**0.36**
Final Consumption Expenditure of General Government	8.71	8.49	8.20	7.15	6.46	5.94	5.38	4.40	5.60	**5.89**
Individual Consumption Expenditure of General Government	2.03	2.10	1.73	1.65	1.50	1.47	1.34	1.09	1.39	1.46
Collective Consumption Expenditure of General Government	6.68	6.40	6.47	5.50	4.96	4.47	4.04	3.31	4.21	4.43
Changes In Inventories	0.73	0.68	0.75	0.74	0.72	0.66	0.64	0.76	0.80	**0.78**

Gross Fixed Capital Formation									25.42
16.56	15.53	14.16	14.17	15.08	14.83	14.72	14.72	19.02	
Exports of Goods And Services									14.22
25.26	31.33	31.44	18.05	18.44	10.67	9.22	13.17	15.50	
Less Imports Of Goods And Services									19.80
17.39	21.46	12.94	13.00	12.45	10.67	11.50	13.17	17.51	
Gross Domestic Product									100.00
100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	

Source: Author's Computation, 2021

Tables 1 & 2 depict the expenditure components of GDP in Nigeria between 2010 and 2019. The series shows government involvement in the economy. The components comprise of Private and NGO expenditure which dominate the larger expenditure in the economy during the period of investigation, followed by expenditure on export, import and investment. Government expenditure takes the least among the components. A mere comparison will immediately show that government involvement in the economy during this period of time was relatively small, but the intuition behind this scenario is that Nigerian Government usually act like a hydra headed Monster influencing all other forms of expenditure incurred in the economy. Examining the real size of government in the economy has become a puzzle in academic literature.

Materials and Methods

The objective of the study is to determine the major determinants of government size in Nigeria. In order to achieve this objective, the study adopted the model by Jibir & Aluthge, (2019). The functional form of the model is specified as follows

GSize = f (GDP, OILR, PKY, POP, INFR, TOP)   (4.14)

Where:

GS = Government Size measured by government expenditure

GDP = Gross domestic product

OILR = Oil revenue

PKY = Per capita income

POP = Urban population

TOP = Trade openness

In mathematical form, the model is re specified as

$$GS_t = \beta_0 + \beta_1 GDP_t + \beta_2 OILR_t + \beta_3 PKY_t + \beta_4 POP_t + \beta_5 INFR_t + \beta_6 TOP_t + \varepsilon_t \qquad (4.15)$$

Equation 4.13 is re specified in tis log form as

$$logGS_t = \beta_0 + \beta_1 logGDP_t + \beta_2 logOILR_t + \beta_3 logPKY_t + \beta_4 logPOP_t + \beta_5 logINFR_t + \beta_6 logTOP_t + \varepsilon_t$$
$$(4.16)$$

Results and Discussion

Descriptive Statistics

The descriptive statistics of all variables were established before carrying out the analysis for this study to see the structure and composition of the data used in this investigation. All of the variables are summarized in Table 5.1. As reported in Table 5.1, the average value of Gross domestic product, corruption index, consumer price index, government expenditure, oil revenue, urban population and per capita income are $33708.34 billion, $3.73 billion, $18.87, $2250.83 billion, $14.34 billion, 36.83 million, and $88.94 billion respectively. The minimum and maximum values for each of the variables are ($3.57 billion and $4.11 billion), ($5.38 and $72.94), ($9.63 billion and $10164.56 billion), ($2.45 billion and $31.79 billion), (21.97 million and 51.15 million), and ($85.96 billion and $92.76 billion), for Gross domestic product, corruption index, consumer price index, government expenditure, oil revenue, urban population and per capita income respectively. The results show that Gross domestic product, consumer price index and government expenditure are all highly skewed considering their values of 1.27, 1.82 and 1.29 (to two decimal places) respectfully, which are each greater than 1. Corruption index and per capita income exhibit moderate symmetric with 0.55 and 0.76. While oil revenue, trade openness and urban population values of 0.30, -0.33 and 0.18 show approximate symmetric.

For kurtosis, all the variables exhibit highly peaked distributions with 3.352215, 5.141493, 3.786526, 2.723015, 1.940842, 2.254798, 1.902475 and 2.059489 for Gross domestic product, consumer price index, government expenditure, oil revenue, per capita income, trade openness, urban population and corruption index respectively.

Except for oil revenue only, the Jarque-Bera test statistics show that the sampled data of all the variables do not have a normal distribution since the values are far from zero.

Table 3: Descriptive Statistics Result

	GDP	CPI	GE	OILR	PKY	TOP	URPOP	CORR
Mean	33708.940	18.873	2250.882	14.344	88.941	32.128	35.831	3.7281
Median	7570.318	12.386	982.843	13.237	88.317	33.872	34.572	3.612
Maximum	152324.100	72.835	10164.560	31.792	92.763	53.278	51.157	4.110
Minimum	137.929	5.388	9.637	2.456	85.962	9.136	21.970	3.570
Std. Dev.	45365.390	16.931	2819.831	6.571	2.059	12.292	8.563	0.156
Skewness	1.266	1.820	1.291	0.296	0.548	-0.331	0.175	0.758
Kurtosis	3.352	5.141	3.787	2.723	1.941	2.255	1.902	2.059
Jarque-Bera	10.894	29.730	12.141	0.713	3.875	1.655	2.212	5.309
Probability	0.004	0.000	0.002	0.700	0.144	0.437	0.331	0.070
Sum	1348358.	754.9236	90035.27	573.7626	3557.659	1285.120	1433.247	149.126
Sum Sq. Dev.	8.03E+10	11179.91	3.10E+08	1683.997	165.301	5893.166	2859.609	0.951
Obs.	40	40	40	40	40	40	40	40

Author's Computation with E-views 10.

Unit Root Test

The nonlinear ARDL allows the mixture for both levels and first difference of our variables and not in an order higher than first difference I(1). However, when there is a variable that is integrated of an order higher than the first difference, then the application of ARDL might not be reliable. Therefore, in order to ensure that all the variables are not stationary in an order higher than 1, all the variables were tested for stationarity. In doing this, the conventional Augmented Dickey Fuller (ADF) and Phillips Perron (PP) unit root tests were carried out and the outcome of the result are reported in Table 3.2. As reported in Table 3.2, none of the variables is integrated of an order higher than one. The result shows a mixture of I(0) and I(1). Oil revenue and corruption were stationary at levels while other variables were stationary at their first difference. This condition satisfies the application of ARDL estimation approach.

However, it should be noted that the traditional unit root test results are vulnerable to error when the data series include structural breaks; and failure to deal with the presence of structural breaks when present in the unit root can lead to incorrect rejection of the null hypothesis of the unit root. Therefore, the unit root test with structural breaks was conducted and reported in Table 3.3. A general Dickey-Fuller test equation, capable of accommodating structural breaks, is estimated after Perron and the t-statistics obtained are used to compare α to 1. As reported in the table, it is confirmed again that none of the variables are integrated with an order higher than one.

Table 4: Unit Root Test Results

Variables	Level		1st Difference	
	ADF	PP	ADF	PP
GDP	-1.323	-1.000**	-3.319	-3.240*
	(0.609)	(0.744)	(0.021)	(0.025)
Gsize	-1.554	-1.232	-3.012	-7.404
	(0.496)	(0.851)	(0.031)	(0.000)
OILR	-2.706	-2.788	-6.382*	-6.462*
	(0.083)	(0.069)	(0.000)	(0.000)
PKY	1.384	-0.774	-6.079*	-2.468*
	(0.998)	(0.815)	(0.000)	(0.001)
TOP	-1.945	-1.856	-7.374*	-7.361*
	(0.309)	(0.349)	(0.000)	(0.003)
URPOP	-0.969	-2.736	-8.333*	-1.756*
	(0.754)	(0.079)	(0.000)	(0.395)
CPI	-3.379	-3.255	-6.902*	-9.718*
	(0.018)	(0.024)	(0.000)	(0.000)
CORR	-1.773**	-1.193*	-2.597*	-6.634*
	(0.386)	(0.668)	(0.005)	(0.000)

Author's Computation with E-views 10. *Note: (1) *,** and *** denotes significance at 1%, 5% and 10% respectively (2) The specification is constant and trend.*

Table 5: Unit Root Tests With Structural Breaks

Variables	Level	First Difference
GDP	-2.793	-4.672**
	(0.791)	(0.023)
TOP	-5.483***	-7.681***
	(0.010)	(0.010)
GSIZE	-2.337	-8.812***
	(0.940)	(0.010)
OILR	-4.835**	-7.139***
	(0.016)	(0.010)
CORR	-10.190***	-5.784***
	(0.010)	(0.010)
PKY	-1.953	-6.806***

	(0.985)		(0.010)
CPI	-7.095***		-7.230***
	(0.010)		(0.010)
URPOP	-4.233*		-12.588***
	(0.090)		(0.010)

Author's Computation with E-views 10. *Note: (1) *, ** and ***denotes significance at 10%, 5% and 1% respectively. (2) Dickey-Fuller min-t is the Break point selection criteria used. (3) Lag length method is F-statistic. (4) Specification is constant and trend. (2) innovation outlier break type is employed.*

Table 6: Summary of the Unit Root Test – Augmented Dickey Fuller

Variables	Level	1st Difference	Order of Int.
GDP	-1.323	-3.319**	I(1)
GSize	-1.554	-3.012*	I(1)
OILR	-2.706*	-	I(0)
PKY	1.384	-6.079*	I(1)
TOP	-1.945	-7.374*	I(1)
URPOP	-0.969	-8.333*	I(1)
CPI	-3.379**	-	I(0)
CORR	-1.773	-2.597*	I(1)

Author's Computation with E-views 10. *Note: *, ** and ***denotes significance at 10%, 5% and 1% respectively.*

Table 7: Summary of the Unit Root Test – Phillip-Perron

Variables	Level	1st Difference	Order of Int.
GDP	-1	-3.240**	I(1)
GSize	-1.232	-7.404***	I(1)
OILR	-2.788*	-	I(0)
PKY	-0.774	-2.468*	I(1)
TOP	-1.856	-7.361***	I(1)
URPOP	-2.736*	-	I(0)
CPI	-3.255**	-	I(0)
CORR	-1.193	-6.634***	I(1)

Author's Computation with E-views 10. *Note: *, ** and ***denotes significance at 10%, 5% and 1% respectively.*

Test for Non-linearity

To determine whether the variable posits non – linearity, the BDS nonlinearity tests was conducted for all the variables. This test was proposed by Brock, Dechert and Scheinkman (BDS) (1996) for testing the likelihood of

nonlinearity in the relationship among variables. This test was applied in testing the relationship between government size, misallocation, resource curse and economic growth in Nigeria. Table 3.4 presents the outcome of the result. As reported, over the various dimensions, the null hypothesis of Identically Independently Distributed Residuals is rejected at 1 percent level of significance for all the variables used in the study. This implies that the data series is nonlinear. Hence, the result confirmed the condition for the application of a nonlinear ARDL methodology

Table 8: Brock, Dechert and Scheinkman (BDS) nonlinearity tests results

BDS Statistics				Embedding dimensions	
Variables	m=2	m=3	m=4	m=5	m=6
GSIZE	0.197*	0.333*	0.433*	0.505*	0.554*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GDP	0.201*	0.339*	0.436*	0.504*	0.552*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
OILR	0.098*	0.148*	0.189*	0.202*	0.177*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CORR	0.139*	0.211*	0.234*	0.226*	0.219*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
TOP	0.147*	0.226*	0.325*	0.356*	0.361*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CPI	0.081*	0.125*	0.170*	0.186*	0.191*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
PKY	0.162*	0.272*	0.345*	0.397*	0.432*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Author's Computation with E-views 10. *Notes: (1)* denotes significance at 1%. (2) m represents the dimension. (3) Reported statistics are obtained from the application of the Brock et al. (BDS, 1996) test on the residuals of a VAR model for the selected variables.*

Test for Asymmetry

After confirming the presence of nonlinearity, the test for asymmetry was conducted for government size, misallocation, resource curse and economic growth. The result is reported in Table 3.5. As presented in the result, the Wald test statistics for the null hypothesis of no long – run asymmetry and short-run symmetries in the NARDL-ECM are rejected in all. The long-run asymmetry test results revealed that government size, misallocation, resource curse affects economic growth asymmetrically. All the results were significant. The significance for both short-run and long-run symmetry and asymmetry supports the use of NARDL asymmetry as the nonlinearity and long-run asymmetry was detected in the data.

Table 8: Long - and Short-run Asymmetry

Test	F-Statistics	Prob.	F-Statistics	Prob.	F-Statistics	Prob.
WLRA	5.063**	0.000	5.701*	0.002	5.328**	0.013
WSRA	2.771***	0.056	3.204**	0.024	3.921***	0.065

Author's Computation with E-views 10. *Note: (1) *, ** and *** represents rejection of the null of no asymmetric and symmetric at 1%, 5% and 10% respectively. (2) WLRA and WSRA refer to the Wald statistics for the long run asymmetry and short run symmetry respectively.*

Determinants of Government Size

The main objective of the study was to investigate the major determinants of government size in Nigeria. In other to achieve this, the Autoregressive Distributive Lag (ARDL) Model is employed with Akaike Info Criteria (1,1,2,1,0,2,2) as shown in figure 1.
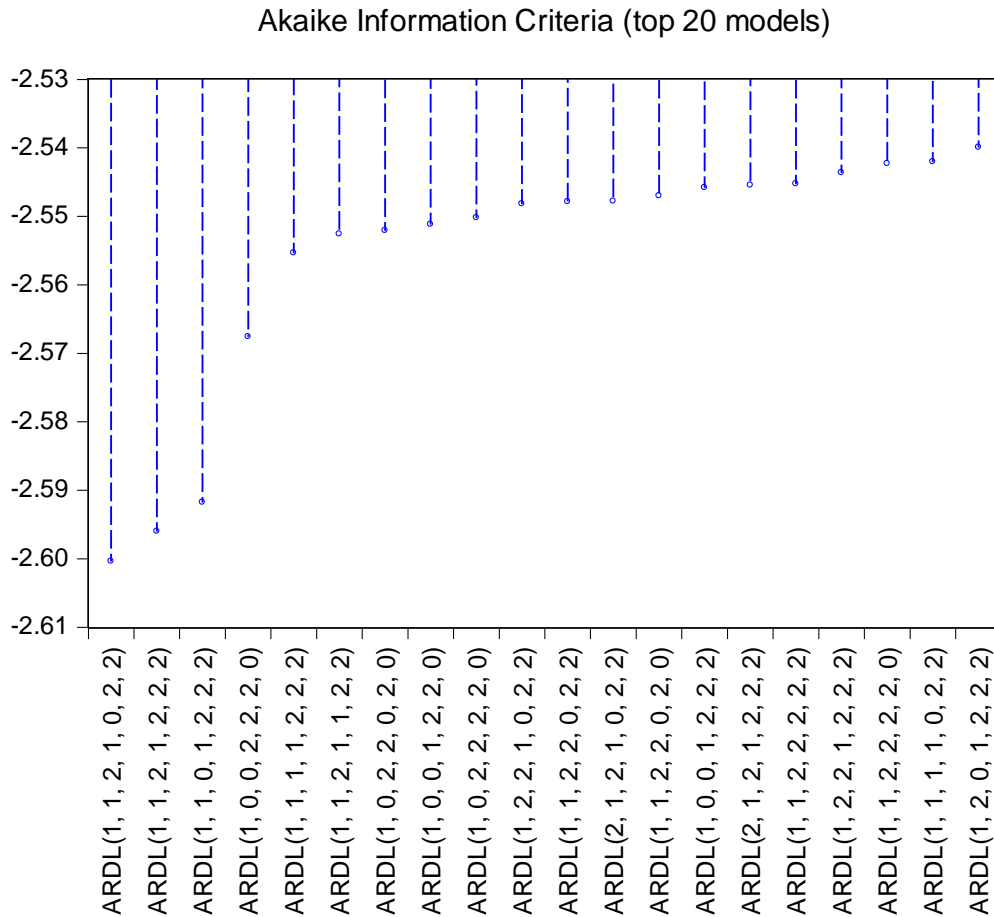
Figure 1: Akaike Information Criterion

Table 8 presents the results for the short run and long run estimate derived from the model specified to achieve the objective of the study in respect to the major determinants of government size in Nigeria. Six variables were used as supported by Jibir and Aluthge (2019) and Wu & Lin (2012). These variables include gross domestic product, per capita GDP, trade openness, oil revenue, urban population, and inflation rate. From the outcome, only lagged value of inflation, oil revenue and current value of oil revenue are major determinants of government size in the short run. However, in the long run, surprisingly GDP, trade openness, inflation CPI and oil revenue are major determinants of government size. These values were significant at 5% with $\rho < 0.05$. however, per capita income, and urban population were not significant. Hence, both are not major determinants of government size in Nigeria.

Table 9: ARDL Regression Results

Variables	Short-run coefficients	Std. error	Prob.
ΔGDP	0.100	0.447	0.824
ΔPKY	-12.446	9.455	0.202
ΔPKY$_{t-1}$	-16.332	10.163	0.122
ΔTOP	0.083	0.124	0.511
ΔURPOP	1.116	1.440	0.447
ΔCPI	-0.031	0.056	0.584
ΔCPI$_{t-1}$	0.143	0.046	0.005
ΔOILR	0.234	0.116	0.056
ΔOILR$_{t-1}$	-0.169	0.082	0.052
Variables	Long-run coefficients	Std. error	Prob.
GDP	0.745	0.151	0.000
PKY	-4.716	3.724	0.219
TOP	0.265	0.120	0.038
URPOP	1.021	1.319	0.447
CPI	-0.166	0.069	0.026
OILR	0.281	0.133	0.046
C	7.027	6.084	0.261

Author's Computation with E-views 10.
The study identifies that the major factors determining government size in Nigeria include gross domestic product, trade openness, inflation, and oil revenue, as well as per capita income, based on the variables used for this measurement.

Conclusion and Recommendations

In conclusion, the examination of determinants of government size in Nigeria has yielded insightful results, emphasizing the pivotal role played by gross domestic product, trade openness, per capita income, and inflation. The findings underscore the interconnectedness of economic variables and the size of the public sector, providing a foundation for targeted policy interventions. The recommended strategies, focusing on fostering economic growth and managing the fiscal implications of increased trade openness, reflect a nuanced and evidence-based approach to addressing the identified determinants. As Nigeria continues to navigate the challenges of fiscal management, incorporating these recommendations into policymaking can contribute to a more sustainable and balanced

government size, aligning with the evolving dynamics of the country's economic landscape. This research not only advances our understanding of the intricate relationship between economic factors and government size but also provides actionable insights for policymakers striving to optimize fiscal policies in the Nigerian context.

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