

PRIVATIZATION, FISCAL POLICY AND MACRO-ECONOMIC AGGREGATES IN NIGERIA “AN IMPACT ANALYSIS” OGBUAGU ANULI REGINA

ABSTRACT

This study investigates the impact of privatization on fiscal policy and its interactional effects on macroeconomic aggregates in Nigeria from 1986 to 2012. The study employs Ordinary Least Square method of estimation on a range of structural equation models- Auto-regressive Distributed Lag Model (ARDL) and Granger Causality Wald Test. Results shows that a percentage increase in privatization proceed increases Nigeria's fiscal responsibility significantly by 13.49% but a percentage increase in the lag of privatization proceed decreases current government expenditure by about 6.3%, though this is not significant. Privatization proceed leads to growth in government expenditure, per capita expenditure, unemployment rate, exchange rate, and GDP with a feedback effect from unemployment rate and GDP. Government expenditure responds to self- produced shocks and transmits positive shock on privatization proceed, but privatization does not produce significant responses and/or shocks to government expenditure. It also does not produce/transmit positive shocks to per capita expenditure, unemployment rate and on itself. Government should therefore, intensify its drive in privatization of public enterprises with closer attention to the management of privatization proceed.

Key Words: Privatization; Fiscal Policy; Macroeconomic Variable; Government Expenditure

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49 **1. INTRODUCTION**

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51 In the 1970s and up to the 1980s many developing countries including Nigeria made
52 extensive use of Public Enterprises (PEs), and this was established to enhance Nigeria's
53 socio- economic development, especially after independence in 1960. The major concern in
54 this regard had been to accelerate development and economic self-reliance through
55 "economic nationalism." The early 1970 marked the increasing prominence in the role of oil
56 sector in the Nigerian economy as evidenced in the boom. The major aim of government at
57 that time was to convert as much as possible, the increasing oil revenue into social, physical,
58 and economic infrastructural investments. Therefore, Nigeria relied heavily upon public
59 enterprises, up to the mid-1980s, for the development, management and allocation of utilities
60 and social services (Ayodele 2004),

61 According to Adeyemo (2005), Nigerian public enterprises have come under gross criticism
62 in spite of the impetus given to them; their problems were so enormous that many
63 government/Nigerians became greatly disillusioned. These criticisms range from lack of
64 productivity/ profitability to reliance on large government subsidies, non-repayment of debt,
65 among others. Ogulano (1986) once argued that between 1975 and 1995, government
66 capital investments in public enterprises totaled about 800billion Naira. In addition to equity
67 investments, government gave subsidies of N11.5 billion to various government enterprises.
68 All these expenditures contributed in no small measure to increase government expenditures
69 and deficits. However, given the negative financial impacts of the global economic crisis on
70 the Nigerian economy in the early eighties, the public sector- led development strategy
71 became unsustainable and there came a strong need for reduction (Nwoye 2010).

72 To address these emerging imbalances, intensification of privatization and
73 commercialization of Nigeria's public enterprises was embraced as one of options in line with
74 the SAP policy. Upon this, a broad range of objectives have been put forward by
75 governments to justify privatization, although the priority given to each has "varied both
76 across countries and within countries over time" (Cook and Uchida 2003). These objectives

majorly grouped into microeconomic and macroeconomic objectives; at microeconomic level, "Privatization is seen primarily as a means of improving the efficiency of enterprises" (Bartel and Harrison 1999). Proponents of privatization argue that "transferring public enterprises to the private sector will expose these enterprises to the discipline of the market, thereby leading them to increase efficiency" (Richard and Mansoor 1998). While at macroeconomic level, Pinherio and Schneider (1995), asserts that Privatization is perceived to be part of the fiscal solution, other macroeconomic effects are that privatization encourages domestic and foreign capital to invest locally. It reflects the government's commitment to economic reform and a positive image to attract foreign investments, also it helps to develop the capital market, create new mechanisms for mobilizing capital and attracting national capital outside the country. It can also enhance employment opportunities, optimizing the use of the national work force, and ensuring the continued equitable increase of individual income.

However, it has not been established empirical in existing literature - the growth relationship/interaction between privatization and fiscal policy, and macroeconomic variables in Nigeria. On one hand, some scholars posit that privatization produces financial and operational benefits; at least enough to offset the economic dislocation linked to it. On the other hand, others are of the view that where such improvement is recorded, it is attributable to increased competition rather than change of ownership. In the shades of these augments, the impact relationship between privatization policy with fiscal and macro- economic aggregates in Nigeria is thus, an empirical question.

Despite this salient question, there is a dearth of Nigeria-base empirical studies investigating the growth interaction between privatization and other macro-economic variables in existing literature. Few attempts by authors like as Odeh (2011), Nwoye (2008), Adeyemo and Adeleke (2008) are mere qualitative reviews of Nigeria's privatization and commercialization policies. Some empirical studies have tried to argue on the impact of privatization on firm productivity in Nigeria, (see, Jerome (2003) and Amakom 2003). Pockets of empirical studies in this regard are found in foreign-base studies which include Barnett et al. (2000), Birch and Haar (2000), Jeronimo et al. (2000), Katsoulakos and Likoyanni (2002), Dolenc (2009), Kibikyo (2011), Plane (1997), Cook and Uchida, (2003), Filipovic (2005), Javadshahraki (2006), Boubakri et al. (2009). Most of the studies however, are cross-country based with little or no country-specifics.

109 The pertinent question still remain; is there interrelationship between privatization, fiscal
110 policy and macro-economic aggregates in Nigeria?, Does variation in Nigeria's privatization
111 process significantly account for variations in fiscal and macro-economic aggregates, in
112 order to answer these research questions, this study examine data from 1986 to 2012 while
113 employing Auto-regressive Distributed Lag Model (ARDL) and Granger Causality Wald Test.
114 And the null hypotheses tested were:

- 115 • **H₀₁**: There is no significant impact of privatization proceed and selected macro-
116 economic aggregates on fiscal policy in Nigeria.
- 117 • **H₀₂**: There is no causal relationship among privatization proceed, fiscal and macro-
118 economic variables in Nigeria

119 In Literature, from the theoretical perspective of privatization (the Property Right Theory,
120 Public Choice and Agency theory), it is expected that at the microeconomic level, privatized
121 firms are well disposed to increase/enhance efficiency and productivity. There are some
122 empirical works that supports the increased efficiency of the privatized firms **Gover (2002)**
123 cover thirty two (32) firms which accounts for 60 percent of total transactions in **Bolivia**. The
124 study checks whether firm's performance improved after privatization period of 1992 to 1999.
125 It discovered that privatization had a significant impact on operating efficiency, profitability
126 increased by over 100%, while employment fell by 15 per cent. While **Amakom, (2003)**
127 carries out a study on three (3) privatized firms in **Nigeria**, namely; FSB International Bank
128 Plc, Aba Textile Mill Plc and Ashaka Cement Plc, using Data Envelopment Analysis (DEA).
129 The study reveals a significant improvement in productivity of the firms. Also, **Afeikhena**
130 **(2003)** assess three newly privatized firms in **Nigeria**. The study appraises the post-
131 privatization performance of the United Bank for Africa (UBA), Ashaka Cement Co. PLC and
132 Unipetrol Nigeria Limited. The specific indicators examined are profitability, productive
133 efficiency, employment, capital investment, output, prices and taxes. He deployed
134 envelopment analysis (DEA) to measure the changes in any given indicator of performance
135 by comparing its average value, five years before and five years after privatization and the
136 results, albeit mixed, shows significant increases in these indicators. Privatization is also
137 associated with increase in technical efficiency in the affected enterprises.

138 At macroeconomic level; some literature covers the impact of privatization on fiscal and
139 macroeconomic aggregates, together with studies on the impact of privatization on economic
140 growth which is the ultimate objective of privatization. As pointed out by Cook and Uchida
141 (2003), "economic performance is likely to be influenced by factors that affect the wider
142 economic environment in which privatized firms operate". Therefore, an attempt is made
143 underneath to survey some of these works. **Barnett (2000)** use panel data analysis to find

144 the fiscal and macro-economic impact of privatization on Transition and Non-transition
 145 countries, one of his major findings is that privatization proceeds transferred to the budget
 146 tend to be saved. Specifically, they were used to reduce domestic financing, and debt stock,
 147 while on the other hand total privatizations proceed is correlated with an improved
 148 macroeconomic aggregates. While **Birch and Haar (2000)** did a descriptive study of the
 149 privatization experience in the last two decades in Argentina, Brazil, Chile, Colombia,
 150 Mexico, Peru, Venezuela and some Caribbean countries. They finds positive effects of
 151 privatization on short and long-run macroeconomic conditions which shows a positive effect
 152 of privatization on productivity and a negative effect on employment. **Jerónimo (2000)** writes
 153 on "Privatization, European Economic and Monetary Union" using panel data analysis to
 154 examine whether privatization receipts have been used as a means of reducing government
 155 deficit in Spain, Greece, Italy and Portugal. The result indicates that there is a negative and
 156 statistically significant relationship between receipts from privatization and deficit for the
 157 period under review, for the four southern countries. **Buobarkri et al, (2003)** explore the
 158 impact of privatization on fiscal variables, growth, unemployment and investment using
 159 country-level panel data of eighteen (18) countries which included ten (10) developing
 160 countries, the rest being transition economies. The empirical evidence indicates that
 161 privatization is positively correlated with real GDP growth rates. The estimate, suggested
 162 that privatization of 1% of GDP would be associated with an increase on the real GDP
 163 growth rate of 0.5% in the year of privatization and 0.4% in the following year. For the non-
 164 transition sample, the effect would be a 1.1% increase in real GDP growth rate in the year of
 165 privatization and 0.8% in the following year. However, as acknowledged by the author
 166 himself, the results of this study are based on a select sample of countries and for a limited
 167 period for which data was available, but the author did not specify the precise span of years
 168 for the study.

169 While **Dolenc (2009)** analyzes the impact of privatization in a post-communist economy to
 170 check the macroeconomic effect of privatization in Slovenia, using co-integration analysis to
 171 test the effect of privatization proceeds on selected macroeconomic variables. Engel
 172 Granger test was used at 5% level of serial correlation and he concluded that privatization
 173 has no statistical significant impact on any of the variables, except on public debt. On the
 174 other hand, **Sunderland (2011)** uses pooled OLS (Ordinary least square) regression to
 175 check the fiscal impact of privatization in forty seven (47) developing Countries using
 176 information from World Bank's database on privatization revenue from 1988 to 2008 and
 177 panel data technique. He found that privatization revenue is correlated with a worsening of
 178 the fiscal budget balance – lending support that revenues from the sales of State-Owned

Enterprises are used to finance a large deficit. **Kibikyo D. (2011)** evaluates fiscal impact of privatization in Uganda between 1992 and 2007. The study investigates the fiscal impact of privatization in Uganda and the findings revealed a mixed fiscal impact of privatization.

2. METHODS

There are various theoretical models that have been developed to explain the different ways in which privatization as a process of economic reform could be beneficial to the macro-economy at large. For example (see Barnett 2000, Katsoulakos and Likoyanni 2002), but the most recent is Dolenc (2009) who employed a simple regression model using Cointegration and Eager – Granger statistics, to test the effect of privatization proceeds on selected macro-economic variable. This study seeks the use of structural equation models to unravel the effects of privatization on fiscal policy, and macro-economic aggregates in Nigeria. To achieve this, we examine the effects in two major ways – privatization and selected macroeconomic impact on fiscal policy, and causality among the variables. Therefore, we employ Autoregressive Distributed Lag Model (ARDL) and Granger Causality Wald model.

2.1 Model Specification

i. Unit-Root Test:

There often exists the problem of non-stationarity in empirical research involving time series data and this renders the traditional tools of econometrics (like OLS and 2SLS) inappropriate. To overcome this unit-root problem, we test for stationarity of the series in use. The Augmented Dickey-Fuller test (ADF) is of choice in this study because of its efficiency in detecting unit root. It is specified as follows:

$$\Delta Y_t = \theta_o + \theta_1 Y_{t-1} + \sum_{i=1}^k b_i \Delta Y_{t-i} + \mu_t \dots\dots\dots (1)$$

where, Y_t is a vector of all variables in the model θ_i and b_i are parameters of the model, μ_t is the white noise at time while k and Δ remain as defined in equation (6) above. This we will achieve, conducting the test by first or second level difference if the series are integrated of order one or order two (i.e. $I(1)$ or $I(2)$). The null hypothesis here is that Y_t has a unit root (that is, non-stationary) and the alternative is that there is no unit root (that is, stationary). If the variables turn out to contain unit roots, we will therefore, conclude that they are non-stationary.

ii. The Auto Regressive Distributed Lag (ARDL) for Objective (1)

In other to capture objective I (that is, impact of privatization proceed and selected macro-economic aggregates on fiscal policy) we adopt Auto Regressive Distributed Lag (ARDL) Model specified as follows:

• **Functional Specification:**

$$\text{GOVTEXP} = f(\text{PRIVP}, \text{PEXP}, \text{UNEMR}, \text{GFCAP}, \text{EXHR}, \text{GDP}) \dots\dots\dots (2)$$

Equation (1) describes fiscal policy, proxied by government expenditure (GOVTEXP) as a function of PRIVP, PEXP, UNEMR, GFCAP, EXHR, INFL and GDP where, GOVTEXP = Government Expenditure, PRIVP = Privatisation Proceeds PEXP = Per capita Expenditure, UNEMR = Unemployment Rate, GFCAP = Gross Fixed Capital Formation, EXHR = Exchange Rate, GDP = Gross Domestic Product while f = functional notation..

• **Econometric form of the ARDL Model**

In other to take of the presence of white noise, we introduce the error term in the model which transforms the mathematical model to an econometric model as specified in equation (3) below:

$$\begin{aligned} \text{GOVTEXP}_t = & b_0 + b_1\text{PRIVP}_t + b_2\text{PEXP}_t + b_3\text{UNEMR}_t + b_4\text{GFCAP}_t + b_5\text{EXHR}_t + b_6\text{INFL}_t + \\ & b_7\text{GDP}_t + b_8\text{GOVTEXP}_{t-1} + b_9\text{PRIVP}_{t-1} + b_{10}\text{PEXP}_{t-1} + b_{11}\text{UNEMR}_{t-1} + \\ & b_{12}\text{GFCAP}_{t-1} + b_{13}\text{EXHR}_{t-1} + b_{14}\text{INFL}_{t-1} + b_{15}\text{GDP}_{t-1} + \mu \dots\dots\dots (3) \end{aligned}$$

where, Inflation (INFL) is introduced in the model as a control variable. b_{is} are the model parameters, t is current year while t-1denotes the previous year. Other variables remain as defined in equation (1) above. The ARDL model expresses government expenditure as dependent on the explanatory variables and their previous values where, μ = the white noise.

The Error Correction Model (ECM) which represents the deviation from the long run equilibrium will be considered if a long-run relationship exists among the variables in other to check the short run dynamics. This is given as:

$$\Delta X_t = \sum_{i=1}^k b_i \Delta X_{t-i} + \sum_{i=1}^k a_i \Delta Y_{t-i} + \lambda ECM_{t-1} + v_t \dots\dots\dots (4)$$

Where, X_t and Y_t are series of cointegrated variables, b_i and a_i are parameters of the model, ECM_{t-1} is the error correction mechanism, λ represents the speed of adjustment showing the rate at which the long run error is corrected in the short run annually, v_t is white noise error term, k is the number of lagged first difference term while Δ is the difference operator. We conduct the ECM realizing that error correction works with stationary data and does not put a priori restrictions on the model; separating long run and short-run effects.

iii. **Granger Causality Test for Objective (2)**

244 To solve the second research objective of checking if there exists a causal relationship
 245 between Nigeria's privatization proceeds and macro-economic variables within the period
 246 under review, we employ the Granger causality test. Accordingly, we specified the general
 247 form as follows:

$$248 \quad Y_t = \beta_o + \sum_{k=1}^m \beta_k Y_{t-K} + \sum_{P=1}^n \alpha_P X_{t-P} + \mu_t \dots\dots\dots (5)$$

$$249 \quad X_t = \gamma_o + \sum_{k=1}^m \lambda_k Y_{t-K} + \sum_{P=1}^n \gamma_P X_{t-P} + V_t \dots\dots\dots (6)$$

250 where; Y_t and X_t are the variables μ_t and V_t are the mutual uncorrelated error terms, t
 251 denotes time and K and P are the number of lags. The null hypothesis is $\alpha_P = 0$ for all P 's
 252 and $\lambda_K = 0$ for all K 's versus the alternative hypothesis that $\alpha_P \neq 0$ and $\lambda_K \neq 0$ for at least
 253 some P 's and K 's. If the coefficient α_P 's are statistically significant while, λ_K 's are not,
 254 then X is said to cause Y . On the other hand, if λ_K 's are statistically significant while α_P 's
 255 are not, then Y is said to cause X (uni-directional causality). However, if both α_P and λ_K are
 256 statistically significant, then causality is said to run both sides which is known as bilateral or
 257 bi-directional causality. We adopt a Granger causality Wald test for this purpose. In this
 258 case, if the probability of the computed χ^2 -value is sufficiently low (less than 0.05) we
 259 reject the null hypothesis, and accept if otherwise.

260 ▪ **Source of Data**

261 Annual time series data is sourced from World Bank Indicators (2010) and 2011 edition of
 262 the CBN statistical bulletin while 2011 and 2012 series are extrapolated using the popular
 263 Moving Average Method.

264 ▪ **Software Packages**

265 Stata11 is used to run the regression while Microsoft Excel 2013 is used to enter the data.

266

267 **3. RESULTS**

268 The unit root test result indicates that all variables (log_govtexp, log_gdp, log_infl, log_exhr,
 269 log_gfcap, log_pexp, log_unemr, and log_privp) are all integrated of order (1). This is
 270 because the absolute values of their computed ADF test statistics are greater than the
 271 absolute value of their tabulated ADF critical values at their level form given 5% level of
 272 significance. The unit root is tested with trends and intercept at level form but the result
 273 indicates that both the trends and intercepts are insignificant. log_govtexp, log_gdp, log_infl,
 274 log_exhr, log_gfcap, log_pexp, log_unemr and log_privp are not stationary at level with

insignificant trend and intercepts but are stationary at 1st difference. Hence, they are integrated of order one $I(1)$. The result is summarized in table 3.1 below.

Table 3.1 Summary of Unit Root Test Result

Variables	ADF t-statistics	5% Critical Value	Order of Integration
D.log_govtexp	-7.671	-3.000	order one (i.e. $I(1)$)
D.Log_gdp	-3.616	-3.000	order one (i.e. $I(1)$)
D.log_infl	-5.074	-3.000	order one (i.e. $I(1)$)
D.log_exhr	-4.395	-3.000	order zero (i.e. $I(0)$)
D.log_gfcap	-3.753	-3.000	order one (i.e. $I(1)$)
D.log_pexp	-9.497	-3.000	order one (i.e. $I(1)$)
D.log_unemr	-6.963	-3.000	order one (i.e. $I(1)$)
D.log_privp	-5.983	-3.000	order one (i.e. $I(1)$)

- **Cointegration Test:**

In order to investigate whether there exists long run relationship among the variables of using the Augmented Dickey-Fuller (ADF) cointegration test at 5% level of significance. The result reveals that all variables do not have long run relationship with log_govtexp. This implies that they are not cointegrated (see Appendix). This is because, the absolute value of the computed Augmented Dickey-Fuller test statistic (-2.240) is less than the tabulated Augmented Dickey-Fuller statistic (-3.000) at 5% level of significance. Since there is no cointegration among the variables, we therefore, let go of the Error Correction (ECM) Model specified in equation (6) of chapter three.

- **Presentation of (ARDL) Regression Result for Objective (1)**

To achieve objective 1, we adopt Auto Regressive Distributed Lag (ARDL) Model. After a granger marginalization of the variables, some of the variables could not survive the test and consequently, dropped while Log_govtexp, log_gdp, log_infl, log_exhr, log_gfcap, log_privp, log_unemr, and log_privp survived the marginalization process. The result of the Auto Regressive Distributed Lag (ARDL) model given in equation (5) of chapter three is therefore, summarized in table 3.2 below.

Table 3.2 Summary of Results of ARDL Dependent (Variable = Log_govtexp)

Variables	Coefficient	Std. Error	t-stat	P> t
log_privp	0.1341561	0.0513699	2.61	0.020

log_pexp	0.3087684	0.1196755	2.58	0.021
log_unemr	-1.1260860	0.4343606	-2.59	0.020
log_gfcap	-0.4561435	0.1682508	-2.71	0.016
log_exhr	0.3404659	0.1261501	2.70	0.016
log_infl	-0.0960605	0.0671134	-1.43	0.173
log_gdp	-0.4478900	0.364109	-1.23	0.238
Log_privpL1.	-0.0633049	0.0432935	-1.46	0.164
Log_govtexpL1.	0.4018036	0.1533702	2.62	0.019
Log_gdpL1.	0.5818908	0.2689122	2.16	0.047
_cons	9.5880370	2.550641	3.76	0.002
R-squared = 0.9936, Adj. R-squared = 0.9893, F(10,15) = 233.13, Prob>F = 0.0000, N = 26, and DW(11, 26) = 2.440747				

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297 As seen from table 3.2, a percentage increase in privatisation proceed (log_privp), increases
 298 Nigeria's fiscal responsibility or government expenditure (log_govtexp) significantly by about
 299 13.49%. A percentage change in per capita expenditure (log_pexp) brings about a 30.9
 300 percentage significant increase in Nigeria government's expenditure (log_govtexp). A
 301 percentage rise in unemployment rate in Nigeria (log_unemr) has about a 112.6% significant
 302 decrease in Nigerian government's expenditure (log_govtexp). More so, a percentage rise in
 303 gross fixed capital formation (log_gfcap), leads a 45.6% significant decrease on government
 304 expenditure (log_govtexp) of Nigeria. However, a percentage increase in exchange rate
 305 (log_exhr) brings about a 34% significant increase in government expenditure (log_govtexp)
 306 of Nigeria. A percentage increase in inflation rate (log_infl) leads to about 9.6% significant
 307 decrease in government expenditure (log_govtexp) of Nigeria. In addition to the above, a
 308 percentage increase in gross domestic product (log_gdp) leads to about 44.8% insignificant
 309 decrease in government expenditure (log_govtexp) of Nigeria.

310 However, a percentage increase in previous years' privatisation proceeds (log_privpL1.)
 311 decreases Nigeria's current fiscal responsibility or current government expenditure
 312 (log_govtexp) insignificantly by about 6.3%. A percentage change in previous years'
 313 government expenditure (log_govtexpL1.), brings about a 40.2% significant increase in
 314 Nigeria's current government expenditure (log_govtexp). Also, a percentage change in
 315 previous years' gross domestic product (log_gdpL1.) brings about 58.2% significant increase
 316 in government's current expenditure (log_govtexp). This is true since Nigeria's GDP in
 317 constantly increasing and budget has been on incremental basis. Moreover, the constant
 318 term is positively related to government current expenditure (log_govtexp) in Nigeria and a
 319 unit increase in it increases government current expenditure (log_govtexp) by about 9.588
 320 units. Here we restrict the ARDL result without proceeding to ECM since there is no

321 evidence of cointegration among the variables. Objective (1) is therefore, considered only in
322 its long run steady state relations.

323

324 • **Causal Relationship (Granger Causality Wald test) Result for Objective**
325 **(2)**

326 We examine the causal relationship between privatization, fiscal policy and macro-
327 economic variables (that is objective two) using the Granger Causality Wald test as
328 summarized below;

329 **Table 3.3; Summary of Granger Causality Result**
330

Lead Variables	Decision	
log_govtexp	granger-causes	log_infl and log_gdp only
log_privp	granger-causes	log_govtexp, log_pexp, log_unemr, log_exhr and log_gdp except log_infl
log_pexp	granger-causes	log_unemr and log_gdp only
log_unemr	granger-causes	log_govtexp, log_privp, log_pexp, log_gfcap except log_exhr and log_infl
log_gfcap	granger-causes	None
log_exhr	granger-causes	log_pexp only
log_infl	granger-causes	log_privp, log_pexp, log_unemr, log_gfcap, log_exhr except log_govtexp
log_gdp	granger-causes	log_govtexp, log_privp, log_pexp, log_unemr, log_gfcap, log_exhr except log_infl
Feedback Interrelationship among Variables		
log_govtexp	↔	log_gdp
log_privp	↔	log_unemr, log_gdp,
log_pexp	↔	log_unemr, log_gdp
log_unemr	↔	log_gdp, log_privp, log_pexp
log_gfcap	↔	None
log_exhr	↔	None
log_infl	↔	log_gdp
log_gdp	↔	log_govtexp, log_privp, log_pexp, log_unemr, log_infl

On feedback interrelationship among the variables, there exist a feedback or bilateral relationship (causality) between log_govtexp and log_gdp, log_privp and log_unemr, log_privp and log_gdp, log_pexp and log_unemr, log_pexp and log_gdp, log_unemr and log_gdp, as well as log_infl and log_gdp since they lead growth accordingly. More so, there exists unidirectional relationships (causality) between log_privp and log_govtexp, log_privp and log_pexp, log_privp and log_exhr, log_unemr and log_govtexp, log_unemr and log_gfcap, log_exhr and log_pexp, log_infl and log_privp, log_infl and log_pexp, log_infl and log_unemr, log_infl and log_gfcap, log_infl and log_exhr, log_gdp and log_gfcap, and log_gdp and log_exhr.

340

3.1 Discussion

• Policy Implication of ARDL Model Result:

Privatization proceed (log_privp) and other macro-economic variables impacted positively on public expenditure except log_unemr, log_infl, log_gdp, and Log_privpL1. While the outcome of log_unemr, log_gdp and Log_privpL1 are in contrast with their economic relationships (including log_exhr). It is important to note here that, though log_unemr does not conform to its economic relationship of being positive with government expenditure, its negative sign on log_govtexp with respect to impact is quite realistic; as this implies that increasing unemployment reduces government capacity to improve the performance of the macro-economic environment. Previous values of privatization proceed (Log_privpL1) impacts negatively on log_govtexp though this is not significant. The implication here is that, government focuses on current value of privatization (log_privp) and fails over time to track performance such that as soon as the funds are budgeted and injected in the current year, they are subsequently mismanaged. GDP is also negative which is in contrast with expectation. This is realistic given the fact that the bulk of Nigeria's GDP is linked to agriculture and this sector of the economy saps government expenditure given the huge sum of funds voted to it annually without reaping corresponding benefits in the areas of taxation which would have meant some positive impact on public finances. However, primary basis/variable of consideration, log_privp, has a significant positive impact at its current value which implies that privatization process generate/saves a lot of money for government especially in the current year.

• Policy Implication of Causality Wald Test Result:

The causality test shows that privatization (log_privp) leads growth in log_govtexp, log_pexp, log_unemr, log_exhr and log_gdp except log_infl with a feedback relationship from log_unemr and log_gdp. Log-govtexp on the other hand, leads growth in log_infl and

log_gdp only. The implication is that, privatization cause's growth in all macro-economic variables under study except inflation. This holds (except log_unemr and log_infl), though privatization does not necessarily have to take place first before the other variables grow. It is expected that privatization will induce efficiency in the system and consequently reduce unemployment in the country. For inflation (log_infl), one would expect an increase in money supply as a result of lump sum of money from privatized firms, which would effect rises in general price levels. The outcome here suggest that the monetary authorities especially, the central bank took preventive measures within the period under review to avert increases in general levels (inflation) as a result of privatization process.

However, there is a feedback causality coming from log_unemr and log_gdp. While this is true for unemployment (log_unemr), that of gross domestic product (log_gdp) does not make any economic sense since inefficiency in the public enterprises that leads to privatization should be a drain on GDP. However, it will be economically reasonable if and only if the causal relationship is in the negative direction. In that case, it will imply that poor growth performance in GDP in the face of public enterprises fuels the move for their (public enterprises) privatization. The causal feedback from unemployment (log_unemr) to privatization is in line with economic expectation since increases in unemployment suggest that public enterprises are not efficient enough to expand and generate employment for the country's teaming unemployed.

4. CONCLUSION

Privatization has grown in leaps and bounds to gain popularity and acceptability among economies of the world. It is an important instrument through which many economies have attained improved economic growth, production and distribution of goods and services, stream-line government structure, and reinvigorate industries hitherto controlled or managed by government. Privatization has come to stay in Nigeria with its structural effects not just on government expenditure but on other selected macro-economic variables. Our findings in this study reveal that privatization impacts significantly on government expenditure. There is also a healthy interrelationship with it and other macro-economic aggregates in the areas of causality and shock responses. Therefore, government should intensify its drive on privatization of public enterprises in the country.

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472 APPENDIX

473 Appendix 1: The ARDL Model Result for Objective (1)

474 reg log_govtexp log_privp log_pexp log_unemr log_gfcap log_exhr log_infl log_gdp l1.log_privp l1.log_govtexp l1.log_gdp

475 Source | SS df MS Number of obs = 26
 476 -----+----- F(10, 15) = 233.13
 477 Model | 68.5582611 10 6.85582611 Prob > F = 0.0000
 478 Residual | .441122067 15 .029408138 R-squared = 0.9936
 479 -----+----- Adj R-squared = 0.9893
 480 Total | 68.9993831 25 2.75997533 Root MSE = .17149

log_govtexp	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
log_privp	.1341561	.0513699	2.61	0.020	.0246638 .2436483
log_pexp	.3087684	.1196755	2.58	0.021	.0536862 .5638506
log_unemr	-1.126086	.4343606	-2.59	0.020	-2.051904 -.2002686
log_gfcap	-.4561435	.1682508	-2.71	0.016	-.8147617 -.0975254
log_exhr	.3404659	.1261501	2.70	0.016	.0715833 .6093485
log_infl	-.0960605	.0671134	-1.43	0.173	-.2391092 .0469883
log_gdp	-.44789	.364109	-1.23	0.238	-1.22397 .32819
log_privp					
L1.	-.0633049	.0432935	-1.46	0.164	-.1555828 .0289731 log_govtexp
L1.	.4018036	.1533702	2.62	0.019	.0749028 .7287044 log_gdp
L1.	.5818908	.2689122	2.16	0.047	.0087181 1.155063
_cons	9.588037	2.550641	3.76	0.002	4.151473 15.0246

497 . estat dwatson

498 Durbin-Watson d-statistic(11, 26) = 2.440747

499 Appendix 2: Granger Causality Test for objective (2)

500 vargranger

501 Granger causality Wald tests

Equation	Excluded	chi2	df	Prob > chi2
log_govtexp	log_privp	2.5875	2	0.274
log_govtexp	log_pexp	4.7859	2	0.091
log_govtexp	log_unemr	3.4767	2	0.176
log_govtexp	log_gfcap	1.7887	2	0.409

510		log_govtexp	log_exhr	.69632	2	0.706	
511		log_govtexp	log_infl	5.2839	2	0.031	
512		log_govtexp	log_gdp	7.5197	2	0.023	
513		log_govtexp	ALL	19.215	14	0.157	
514		+-----					
515		log_privp	log_govtexp	21.327	2	0.000	
516		log_privp	log_pexp	16.187	2	0.000	
517		log_privp	log_unemr	15.966	2	0.000	
518		log_privp	log_gfcap	3.3892	2	0.184	
519		log_privp	log_exhr	10.33	2	0.006	
520		log_privp	log_infl	2.9378	2	0.230	
521		log_privp	log_gdp	18.935	2	0.000	
522		log_privp	ALL	93.804	14	0.000	
523		+-----					
524		log_pexp	log_govtexp	5.33	2	0.070	
525		log_pexp	log_privp	3.4607	2	0.177	
526		log_pexp	log_unemr	10.86	2	0.004	
527		log_pexp	log_gfcap	3.1747	2	0.204	
528		log_pexp	log_exhr	1.4257	2	0.490	
529		log_pexp	log_infl	3.6782	2	0.159	
530		log_pexp	log_gdp	9.7205	2	0.008	
531		log_pexp	ALL	115.59	14	0.000	
532		+-----					
533		log_unemr	log_govtexp	14.997	2	0.001	
534		log_unemr	log_privp	9.6275	2	0.008	
535		log_unemr	log_pexp	10.548	2	0.005	
536		log_unemr	log_gfcap	32.905	2	0.000	
537		log_unemr	log_exhr	4.687	2	0.096	
538		log_unemr	log_infl	4.9367	2	0.085	
539		log_unemr	log_gdp	7.1875	2	0.027	
540		log_unemr	ALL	145.95	14	0.000	
541		+-----					
542		log_gfcap	log_govtexp	1.2455	2	0.536	
543		log_gfcap	log_privp	.07131	2	0.965	
544		log_gfcap	log_pexp	.98719	2	0.610	
545		log_gfcap	log_unemr	1.5577	2	0.459	
546		log_gfcap	log_exhr	2.8005	2	0.247	
547		log_gfcap	log_infl	1.353	2	0.508	
548		log_gfcap	log_gdp	3.9925	2	0.136	
549		log_gfcap	ALL	64.919	14	0.000	
550		+-----					
551		log_exhr	log_govtexp	4.2546	2	0.119	
552		log_exhr	log_privp	2.1235	2	0.346	
553		log_exhr	log_pexp	7.8201	2	0.020	
554		log_exhr	log_unemr	4.3524	2	0.113	
555		log_exhr	log_gfcap	4.1266	2	0.127	
556		log_exhr	log_infl	.13072	2	0.937	
557		log_exhr	log_gdp	4.6604	2	0.097	
558		log_exhr	ALL	71.911	14	0.000	
559		+-----					
560		log_infl	log_govtexp	1.6095	2	0.500	
561		log_infl	log_privp	29.004	2	0.000	
562		log_infl	log_pexp	10.319	2	0.006	
563		log_infl	log_unemr	14.897	2	0.001	
564		log_infl	log_gfcap	6.4846	2	0.039	
565		log_infl	log_exhr	16.437	2	0.000	
566		log_infl	log_gdp	24.206	2	0.000	
567		log_infl	ALL	138.62	14	0.000	
568		+-----					
569		log_gdp	log_govtexp	19.108	2	0.000	
570		log_gdp	log_privp	19.439	2	0.000	
571		log_gdp	log_pexp	14.904	2	0.001	
572		log_gdp	log_unemr	26.712	2	0.000	
573		log_gdp	log_gfcap	8.4444	2	0.015	
574		log_gdp	log_exhr	30.539	2	0.000	
575		log_gdp	log_infl	9.6364	2	0.008	
576		log_gdp	ALL	96.692	14	0.000	

```

577 +-----+
578 Unit Root Test
579 log_govtexp ~ I(1)
580 . dfuller d.log_govtexp
581 Dickey-Fuller test for unit root          Number of obs =    25
582 ----- Interpolated Dickey-Fuller -----
583      Test      1% Critical      5% Critical      10% Critical
584      Statistic      Value      Value      Value
585 -----
586 Z(t)      -7.671      -3.750      -3.000      -2.630
587 -----
588 MacKinnon approximate p-value for Z(t) = 0.0000
589 log_gdp ~ I(1)
590 . dfuller d.log_gdp
591 Dickey-Fuller test for unit root          Number of obs =    25
592 ----- Interpolated Dickey-Fuller -----
593      Test      1% Critical      5% Critical      10% Critical
594      Statistic      Value      Value      Value
595 -----
596 Z(t)      -3.616      -3.750      -3.000      -2.630
597 -----
598 MacKinnon approximate p-value for Z(t) = 0.0055
599 log_infl ~ I(1)
600 dfuller d.log_infl
601 Dickey-Fuller test for unit root          Number of obs =    25
602 ----- Interpolated Dickey-Fuller -----
603      Test      1% Critical      5% Critical      10% Critical
604      Statistic      Value      Value      Value
605 -----
606 Z(t)      -5.074      -3.750      -3.000      -2.630
607 -----
608 MacKinnon approximate p-value for Z(t) = 0.0000
609 log_exhr ~ I(1)
610 dfuller d.log_exhr
611 Dickey-Fuller test for unit root          Number of obs =    25
612 ----- Interpolated Dickey-Fuller -----
613      Test      1% Critical      5% Critical      10% Critical
614      Statistic      Value      Value      Value
615 -----
616 Z(t)      -4.395      -3.750      -3.000      -2.630
617 -----
618 MacKinnon approximate p-value for Z(t) = 0.0003
619 log_gfcap ~ I(1)
620 . dfuller d.log_gfcap
621 Dickey-Fuller test for unit root          Number of obs =    25
622 ----- Interpolated Dickey-Fuller -----
623      Test      1% Critical      5% Critical      10% Critical
624      Statistic      Value      Value      Value
625 -----
626 Z(t)      -3.753      -3.750      -3.000      -2.630
627 -----
628 MacKinnon approximate p-value for Z(t) = 0.0034
629 log_pexp ~ I(1)
630 . dfuller d.log_pexp
631 Dickey-Fuller test for unit root          Number of obs =    25
632 ----- Interpolated Dickey-Fuller -----
633      Test      1% Critical      5% Critical      10% Critical
634      Statistic      Value      Value      Value
635 -----
636 Z(t)      -9.497      -3.750      -3.000      -2.630
637 -----
638 MacKinnon approximate p-value for Z(t) = 0.0000
639 log_unemr ~ I(1)
640 dfuller d.log_unemr
641 Dickey-Fuller test for unit root          Number of obs =    25
642 ----- Interpolated Dickey-Fuller -----
643      Test      1% Critical      5% Critical      10% Critical

```

```

644         Statistic      Value      Value      Value
645 -----
646 Z(t)      -6.963      -3.750      -3.000      -2.630
647 -----
648 MacKinnon approximate p-value for Z(t) = 0.0000
649 log_privp ~ I(1)
650 dfuller d.log_privp
651 Dickey-Fuller test for unit root      Number of obs   =    25
652 ----- Interpolated Dickey-Fuller -----
653      Test      1% Critical      5% Critical      10% Critical
654      Statistic      Value      Value      Value
655 -----
656 Z(t)      -5.983      -3.750      -3.000      -2.630
657 -----
658 MacKinnon approximate p-value for Z(t) = 0.0000
659 Cointegration Test
660 dfuller uhat
661 Dickey-Fuller test for unit root      Number of obs   =    25
662 ----- Interpolated Dickey-Fuller -----
663      Test      1% Critical      5% Critical      10% Critical
664      Statistic      Value      Value      Value
665 -----
666 Z(t)      -2.240      -3.750      -3.000      -2.630
667 -----
668 MacKinnon approximate p-value for Z(t) = 0.1921
669

```

670 **Econometric Tests**
 671 **Correlation Matrix**
 672 . correlate log_govtexp log_privp log_pexp log_unemr log_gfcap log_exhr log_infl log_gdp l1.log_privp l1.log_govtexp
 673 l1.log_gdp
 674 (obs=26)

	log_govtexp	log_privp	log_pexp	log_unemr	log_gfcap	log_exhr	log_infl	log_gdp	l1.log_privp	l1.log_govtexp
log_govtexp	1.0000									
log_privp	0.6154	1.0000								
log_pexp	0.9159	0.5566	1.0000							
log_unemr	-0.2946	-0.4926	-0.0307	1.0000						
log_gfcap	0.8744	0.6082	0.9478	-0.0251	1.0000					
log_exhr	0.9665	0.5547	0.9381	-0.1247	0.9172	1.0000				
log_infl	-0.0676	0.3747	-0.0143	-0.3335	-0.0871	-0.0732	1.0000			
log_gdp	0.9480	0.6350	0.9673	-0.1171	0.9722	0.9640	-0.0825	1.0000		
l1.log_privp									1.0000	
l1.log_govtexp										1.0000

675
 676 **Normality Test**
 677 mvtest normality log_govtexp log_privp log_pexp log_unemr log_gfcap log_exhr log_infl log_gdp
 678 Test for multivariate normality

679 Doornik-Hansen chi2(14) = 2.2251 Prob>chi2 = 0.0367
 680 **Heteroskedasticity Test**
 681 estat imtest, white

682
 683 **White's test for Ho: homoskedasticity**
 684 against Ha: unrestricted heteroskedasticity

685
 686 chi2(25) = 16.00
 687 Prob > chi2 = 0.0407

688
 689 **Cameron & Trivedi's decomposition of IM-test**

Source	chi2	df	p
Heteroskedasticity	16.00	25	0.0407
Skewness	8.24	10	0.6058
Kurtosis	0.66	1	0.4165
Total	34.90	36	0.5209

700
 701 **Specification Error Test**
 702 estat ovtest
 703 **Ramsey RESET test using powers of the fitted values of log_govtexp**
 704 Ho: model has no omitted variables
 705 F(3, 12) = 2.55
 706 Prob > F = 0.1048