

1
2 **PRIVATIZATION, FISCAL POLICY AND MACRO-ECONOMIC AGGREGATES IN**
3 **NIGERIA “AN IMPACT ANALYSIS”**
4 **OGBUAGU ANULI REGINA**
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17 **ABSTRACT**
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19 *Privatization of public enterprises was introduced in Nigeria in the mid-1980s, as one of the*
20 *key public sector policy initiated towards maintaining stability in fiscal and macroeconomic*
21 *aggregates. This study investigates the impact of privatization on fiscal policy and its*
22 *interactional effects on macroeconomic aggregates in Nigeria from 1986 to 2012. The study*
23 *employs Ordinary Least Square method of estimation on a range of structural equation*
24 *models- Auto-regressive Distributed Lag Model (ARDL) and Granger Causality Wald Test.*
25 *Results shows that a percentage increase in privatization proceed increases Nigeria’s fiscal*
26 *responsibility significantly by 13.49% but a percentage increase in the lag of privatization*
27 *proceed decreases current government expenditure by about 6.3%, though this is not*
28 *significant. Privatization proceed leads to growth in government expenditure, per capita*
29 *expenditure, unemployment rate, exchange rate, and GDP with a feedback effect from*
30 *unemployment rate and GDP. Government expenditure responds to self- produced shocks*
31 *and transmits positive shock on privatization proceed, but privatization does not produce*
32 *significant responses and/or shocks to government expenditure. It also does not*
33 *produce/transmit positive shocks to per capita expenditure, unemployment rate and on itself.*
34 *Government should therefore, intensify its drive in privatization of public enterprises with*
35 *closer attention to the management of privatization proceed.*
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40 **Key Words:** *Privatization; Fiscal Policy; Macroeconomic Variable; Government Expenditure*

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43 1. INTRODUCTION

44

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

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

66 To address these emerging imbalances, intensification of privatization and
67 commercialization of Nigeria's public enterprises was embraced as one of options in line with
68 the Structural Adjustment Programme (SAP) policy. Upon this, a broad range of objectives
69 have been put forward by governments to justify privatization, although the priority given to
70 each has "varied both across countries and within countries over time" (Cook and Uchida
71 2003). These objectives majorly grouped into microeconomic and macroeconomic
72 objectives; at microeconomic level, "Privatization is seen primarily as a means of improving
73 the efficiency of enterprises" (Bartel and Harrison 1999). Proponents of privatization argued
74 that "transferring public enterprises to the private sector will expose these enterprises to the
75 discipline of the market, thereby leading them to increase efficiency" (Richard and Mansoor
76 1998). While at macroeconomic level, Pinherio and Schneider (1995), asserts that

77 Privatization is perceived to be part of the fiscal solution, other macroeconomic effects are
78 that privatization encourages domestic and foreign capital investment locally. It reflects the
79 government's commitment to economic reform and a positive image to attract foreign
80 investment, also it helps to develop the capital market, create new mechanisms for
81 mobilizing capital and attracting national capital outside the country. It can also enhance
82 employment opportunities, optimizing the use of the national work force, and ensuring the
83 continued equitable increase of individual income.

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

92 Despite this salient question, there is a dearth of Nigeria-base empirical studies investigating
93 the growth interaction between privatization and other macro-economic variables in existing
94 literature. Few attempts by authors like as Odeh (2011), Nwoye (2008), Adeyemo and
95 Adeleke (2008) are mere qualitative reviews of Nigeria's privatization and commercialization
96 policies. Some empirical studies have tried to argue on the impact of privatization on firm
97 productivity in Nigeria, (see, Jerome (2003) and Amakom 2003). Pockets of empirical
98 studies in this regard are found in foreign-base studies which include Barnett et al. (2000),
99 Birch and Haar (2000), Jeronimo et al. (2000), Katsoulakos and Likoyanni (2002), Dolenc
100 (2009), Kibikyo (2011), Plane (1997), Cook and Uchida, (2003), Filipovic (2005),
101 Javadshahraki (2006), Boubakri et al. (2009). Most of the studies however, are cross-country
102 based with little or no country-specifics.

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

- 109 • H_{01} : There is no significant impact of privatization proceed and selected macro-
110 economic aggregates on fiscal policy in Nigeria.
111 • H_{02} : There is no causal relationship among privatization proceed, fiscal and macro-
112 economic variables in Nigeria.

113 **Theoretical and Empirical Literature;**

114 According to Fillipovic (2005), Privatization is defined as “A method of allocating assets and
115 functions from public sector to the private sector”. As such privatization constitutes a
116 fundamental structural change of ownership which is transferred from public to private
117 sector, leading to a drastic shift in the underlying incentives of the respective owners and in
118 the objectives of the firm (from politically-oriented to profit-oriented). Conceptually, the
119 commercialization and privatization Decree 1988 perceives Privatization as, “The transfer of
120 government owned shareholding in designated enterprises to private shareholder --
121 comprising individuals and corporate bodies”. It involves the sales of equities in public
122 enterprises to private investors, with or without the loss of government control in these
123 organizations. It may take the form of deregulation of state monopolies by the abrogation of
124 legislation restricting entry into economic activities. A world-wide era of privatization has
125 been picking up momentum in recent decades, making it a fairly new trend in the areas of
126 economic policy. The modern idea of privatization as an economic policy was pursued for the
127 first time by the Federal Republic of Germany in 1957, when the government eventually sold
128 its majority stake in Volkswagen to private investors. The next big move in privatization came
129 in 1980s with Margret Thatcher’s privatization of Britain’s Telecom and Chirac’s (former
130 French Prime Minister) privatization of government-owned communication companies
131 (Magginson, Nash, and Randenborgh 1996). Some Latin American countries launched
132 significant privatization programs following decades of static economic policies, trade
133 protection, heavy-headed regulation and even nationalization.

134 Another major contribution to the world wide process of privatization has been between the
135 falls of the communist regime in Eastern Europe and the former Soviet Union. Recently,
136 countries like China, and Cuba, as well as many other developing countries have begun to
137 implement privatization in the hope of stimulating economic growth. This has spread all over
138 the world and has been one of the major economic phenomena in the world economic
139 history. The largest privatization in history took place in Russia between 1992 and 1995,
140 when as many as 75,000 small and medium scale enterprises were auctioned, 14,000
141 medium to large scale firms were also sold. In Africa, privatization took off in Ghana in 1983
142 and subsequently in Nigeria in 1986. It has been adopted by other African countries.

143 From the theoretical perspective of privatization (the Property Right Theory, Public Choice
144 and Agency theory), it is expected that at the microeconomic level, privatized firms are well
145 disposed to increase/enhance efficiency and productivity. There are some empirical works
146 that supports the increased efficiency of the privatized firms **Gover (2002)** cover thirty two
147 (32) firms which accounts for 60 percent of total transactions in **Bolivia**, the study checks
148 whether firm's performance improved after privatization period of 1992 to 1999. It discovered
149 that privatization had a significant impact on operating efficiency, profitability increased by
150 over 100%, while employment fell by 15 per cent. While **Amakom, (2003)** carries out a study
151 on three (3) privatized firms in **Nigeria**, namely; FSB International Bank Plc, Aba Textile Mill
152 Plc and Ashaka Cement Plc, using Data Envelopment Analysis (DEA), he reveals a
153 significant improvement in productivity of the firms. Also, **Afeikhena (2003)** assess three
154 newly privatized firms in **Nigeria**, the study appraises the post-privatization performance of
155 the United Bank for Africa (UBA), Ashaka Cement Co. PLC and Unipetrol Nigeria Limited;
156 the specific indicators examined are profitability, productive efficiency, employment, capital
157 investment, output, prices and taxes. He deployed envelopment analysis (DEA) to measure
158 the changes in any given indicator of performance by comparing its average value, five
159 years before and five years after privatization and the results, albeit mixed, shows significant
160 increases in these indicators and privatization is also associated with increase in technical
161 efficiency in the affected enterprises.

162 At macroeconomic level; some literature covers the impact of privatization on fiscal and
163 macroeconomic aggregates, together with studies on the impact of privatization on economic
164 growth which is the ultimate objective of privatization. As pointed out by Cook and Uchida
165 (2003), "economic performance is likely to be influenced by factors that affect the wider
166 economic environment in which privatized firms operate". Therefore, an attempt is made
167 underneath to survey some of these works.

168 **Barnett (2000)** use panel data analysis to find the fiscal and macro-economic impact of
169 privatization on Transition and Non-transition countries, one of his major findings is that
170 privatization proceeds transferred to the budget tend to be saved. Specifically, they were
171 used to reduce domestic financing, and debt stock, while on the other hand total privatization
172 proceed is correlated with an improved macroeconomic aggregates. While **Birch and Haar**
173 **(2000)** did a descriptive study of the privatization experience in the last two decades in
174 Argentina, Brazil, Chile, Colombia, Mexico, Peru, Venezuela and some Caribbean countries;
175 **they found positive effects** of privatization on short and long-run macroeconomic conditions-
176 which revealed a positive effect of privatization on productivity and a negative effect on
177 employment. **Jerónimo (2000)** writes on "Privatization **in** European Economic and Monetary
178 Union" using panel data analysis to examine whether privatization receipts have been used

179 as a means of reducing government deficit in Spain, Greece, Italy and Portugal. The result
180 indicates that there is a negative and statistically significant relationship between receipts
181 from privatization and deficit for the period under review, for the four southern countries.
182 **Buobarkri et al, (2003)** explore the impact of privatization on fiscal variables, growth,
183 unemployment and investment using country-level panel data of eighteen (18) countries
184 which included ten (10) developing countries, the rest being transition economies; The
185 empirical evidence indicates that privatization is positively correlated with real GDP growth
186 rates. The **estimated result**, suggested that privatization of 1% of GDP would be associated
187 with an increase on the real GDP growth rate of 0.5% in the year of privatization and 0.4% in
188 the following year. For the non-transition sample, the effect would be a 1.1% increase in real
189 GDP growth rate in the year of privatization and 0.8% in the following year. However, as
190 acknowledged by the author himself, the results of this study are based on a select sample
191 of countries and for a limited period for which data was available, but the author did not
192 specify the precise span of years for the study.

193 While **Dolenc (2009)** analyzes the impact of privatization in a post-communist economy to
194 check the macroeconomic effect of privatization in Slovenia, using co-integration analysis to
195 test the effect of privatization proceed on selected macroeconomic variables; Engel Granger
196 test was used at 5% level of serial correlation and he concluded that privatization has no
197 statistical significant impact on any of the variables, except on public debt. On the other
198 hand, **Sunderland (2011)** uses pooled OLS (Ordinary least square) regression to check the
199 fiscal impact of privatization in forty seven (47) developing Countries using information from
200 World Bank's database on privatization revenue from 1988 to 2008 and panel data
201 technique. He found that privatization revenue is correlated with a worsening of the fiscal
202 budget balance – lending support that revenues from the sales of State-Owned Enterprises
203 are used to finance a large deficit. **Kibikyo D. (2011)** evaluates fiscal impact of privatization
204 in Uganda between 1992 and 2007. The study investigates the fiscal impact of privatization
205 in Uganda **and the findings showed a mixed result.**

206 **2. METHODS**

207 There are various theoretical models that have been developed to explain the different ways
208 in which privatization as a process of economic reform could be beneficial to the macro-
209 economy at large. For example (see Barnet 2000, Katsoulakos and Likoyanni 2002), but the
210 most recent is Dolenc (2009) who employed a simple regression model using Cointegration
211 and Eager – Granger statistics, to test the effect of privatization proceed on selected macro-
212 economic variable. **This study uses** structural equation models, to unravel the effects of

213 privatization on fiscal policy, and macro-economic aggregates in Nigeria. To achieve this, we
 214 examine the effects in two major ways – privatization and selected macroeconomic impact
 215 on fiscal policy, and causality among the variables. Therefore, we employ Autoregressive
 216 Distributed Lag Model (ARDL) and Granger Causality Wald model.

217 **2.1 Model Specification**

218 **i. Unit-Root Test:**

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

$$224 \quad \Delta Y_t = \theta_o + \theta_1 Y_{t-1} + \sum_{i=1}^k b_i \Delta Y_{t-i} + \mu_t \dots\dots\dots (1)$$

225 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
 226 the white noise at time while k and Δ remain as defined in equation (6) above. This we will
 227 achieve, conducting the test by first or second level difference if the series are integrated of
 228 order one or order two (i.e. $I(1)$ or $I(2)$). The null hypothesis here is that Y_t has a unit root
 229 (that is, non-stationary) and the alternative is that there is no unit root (that is, stationary). If
 230 the variables turn out to contain unit roots, we will therefore, conclude that they are non-
 231 stationary.

232 • **Cointegration Test:** Next is cointegration test to check for existence of a stable long-run
 233 relationship among the variables; given that cointegration test examines whether some linear
 234 combination of non-stationary series in the regression produces a white noise process or
 235 not. The ADF cointegration test is employed in the estimation. Should a long-run relationship
 236 be identified among the variables, the short run dynamics will be examined using the Error-
 237 Correction Mechanism (ECM).

238

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

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

243 • **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 care 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:

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

where, Inflation (INFL) is introduced in the model as a control variable. b_{1s} are the model parameters, t is current year while $t-1$ denotes 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.

iii. Granger Causality Test for Objective (2)

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

$$Y_t = \beta_0 + \sum_{k=1}^m \beta_k Y_{t-k} + \sum_{p=1}^n \alpha_p X_{t-p} + \mu_t \dots\dots\dots (5)$$

$$X_t = \gamma_0 + \sum_{k=1}^m \lambda_k Y_{t-k} + \sum_{p=1}^n \gamma_p X_{t-p} + V_t \dots\dots\dots (6)$$

where; Y_t and X_t are the variables μ_t and V_t are the mutual uncorrelated error terms, t denotes time and K and P are the number of lags. The null hypothesis is $\alpha p = 0$ for all P 's 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 some P 's and K 's. If the coefficient αp 's are statistically significant while, λk 's are not, then X is said to cause Y . On the other hand, if λk 's are statistically significant while αp 's

are not, then Y is said to cause X (uni-directional causality). However, if both αp and λk are statistically significant, then causality is said to run both sides which is known as bilateral or bi-directional causality. We adopt a Granger causality Wald test for this purpose. In this case, if the probability of the computed Chi^2 -value is sufficiently low (less than 0.05) we reject the null hypothesis, and accept if otherwise.

- **Variable Definition**

Privatization Variable (PRIVP): Privatization Proceed refers to funds that are accruing to government as a result of change in ownership of government investment in public enterprises. It has been variously been used by Plane (1997), Cook and Uchida, (2003). Boubakri et al, (2004) and privatization related studies. Plane (1997), Cook and Uchida (2003) and Barnett (2000) argued that total privatization proceed is a good proxy in accessing the relationship between it and other macro-economic variables. Its economic relationship with government expenditure is positive.

Government Expenditure (GOVTEXP): is government spending incurred by central, state and local governments of a country in a bid to satisfy the collective social wants of the people. A fiscal crisis is a major determinant of; if not a necessary condition for the decision to privatize public enterprises. Privatization is perceived a part of fiscal solution. Since it provides revenue that can be used to offset deficit and free government from the burden of subsidizing loss-making state enterprises. Eliminating subsidies given to state enterprises has a clear positive impact. In many cases, government has used revenues from privatization to reduce the stock of public debt, but the ultimate use of privatization revenues is a function of the overall fiscal performance of government (see Katsolakis 2003, Barnett 2000, and IMF 2000)

- **Source of Data**

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

- **Software Packages**

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

3. RESULTS ;

The unit root test result indicates that all variables ($\log_{\text{govtexp}}$, $\log_{\text{gdp}}$, $\log_{\text{infl}}$, $\log_{\text{exhr}}$, $\log_{\text{gfcap}}$, $\log_{\text{pexp}}$, $\log_{\text{unemr}}$, and $\log_{\text{privp}}$) are all integrated of order (1). This is because the absolute values of their computed ADF test statistics are greater than the

absolute value of their tabulated ADF critical values at their level form given 5% level of significance. The unit root is tested with trends and intercept at level form but the result indicates that both the trends and intercepts are insignificant. log_govtexp, log_gdp, log_infl, 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	I(1)
D.log_infl	-5.074	-3.000	I(1)
D.log_exhr	-4.395	-3.000	I(1)
D.log_gfcap	-3.753	-3.000	I(1)
D.log_pexp	-9.497	-3.000	I(1)
D.log_unemr	-6.963	-3.000	I(1)
D.log_privp	-5.983	-3.000	I(1)

• Cointegration Test:

In order to investigate whether there exist long run relationship among the variables 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 for result). 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. Therefore, there is no cointegration among the variables.

• 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 is summarized in table 3.2 below.

339

340 **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	-2.71	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

341

342 From the above table, a percentage increase in privatization proceed (log_privp), increases
 343 government expenditure (log_govtexp) significantly by about 13.49%. A percentage change
 344 in per capita expenditure (log_pexp) brings about a 30.9 percentage significant increase in
 345 Nigeria government's expenditure (log_govtexp). A percentage rise in unemployment rate in
 346 Nigeria (log_unemr) has about 112.6% significant decrease in Nigerian government's
 347 expenditure (log_govtexp). More so, a percentage rise in gross fixed capital formation
 348 (log_gfcap), leads a 45.6% significant decrease on government expenditure (log_govtexp) of
 349 Nigeria. However, a percentage increase in exchange rate (log_exhr) brings about a 34%
 350 significant increase in government expenditure (log_govtexp) of Nigeria. A percentage
 351 increase in inflation rate (log_infl) leads to about 9.6% significant decrease in government
 352 expenditure (log_govtexp). In addition to the above, a percentage increase in gross domestic
 353 product (log_gdp) leads to about 44.8% insignificant decrease in government expenditure
 354 (log_govtexp).
 355 However, percentage increases in previous years' privatization proceed (log_privpL1.)
 356 decreases Nigeria's current government expenditure (log_govtexp) insignificantly by about
 357 6.3%. A percentage change in previous years' government expenditure (log_govtexpL1.),
 358 brings about a 40.2% significant increase in Nigeria's current government expenditure
 359 (log_govtexp). Also, a percentage change in previous years' gross domestic product
 360 (log_gdpL1.) brings about 58.2% significant increases in government's current expenditure
 361 (log_govtexp). This is true since Nigeria's GDP is constantly increasing and budget has
 362 been on incremental basis. Moreover, the constant term is positively related to government
 363 current expenditure (log_govtexp) and a unit increase in it increases government current

364 expenditure (log_govtexp) by about 9.588 units. Here we restrict the ARDL result without
 365 proceeding to ECM since there is no evidence of cointegration among the variables.
 366 Objective (1) is therefore, considered only in its long run steady state relations.

367

368 • **Causal Relationship (Granger Causality Wald test) Result for Objective**
 369 **(2)**

370 We examined the causal relationship between privatization, fiscal policy and macro-
 371 economic variables (that is objective two) using the Granger Causality Wald test as
 372 summarized below;

373 **Table 3.3; Summary of Granger Causality Result**
 374

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

375

376 On feedback interrelationship among the variables, there exists a feedback or bilateral
 377 relationship (causality) between log_govtexp and log_gdp, log_privp and log_unemr,
 378 log_privp and log_gdp, log_pexp and log_unemr, log_pexp and log_gdp, log_unemr and
 379 log_gdp, as well as log_infl and log_gdp since they lead growth accordingly. More so, there
 380 exists unidirectional relationships (causality) between log_privp and log_govtexp, log_privp
 381 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.

385

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 the impact is quite realistic; as this implies that increased 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 agricultural sector 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 impacted positively on public finances. However, the primary 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.

407

• Policy Implication of Causality Wald Test Result:

The causality test result showed 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. Though privatization does not necessarily have to take place first before the macroeconomic 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

417 money from privatized firms, which would in effect cause increase in general price level. The
418 outcome here suggests that the monetary authorities especially, the central bank took
419 preventive measures within the period under review to avert increases in general price levels
420 as a result of privatization process.

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

431 4. CONCLUSION

432 Privatization has grown in leaps and bounds to gain popularity and acceptability among
433 economies of the world. It is an important instrument through which many economies have
434 attained improved economic growth, production and distribution of goods and services,
435 stream-line government structure, and reinvigorate industries hitherto controlled or managed
436 by government. Privatization has come to stay in Nigeria with its structural effects not just on
437 government expenditure but on other selected macro-economic variables. Our findings in
438 this study revealed that privatization impacted significantly on government expenditure.
439 There is also a healthy interrelationship with it and other macro-economic aggregates in the
440 areas of causality and shock responses. Therefore, we concludes given the obtained results,
441 that the intensification of privatization of public enterprises should make the country better
442 off.

443

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520 **ANNEX**

ANNEX 1: The ARDL Model Result for Objective (1)

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

Source	SS	df	MS	Number of obs =	26
-----+-----					
F(10, 15) = 233.13					
Model	68.5582611	10	6.85582611	Prob > F =	0.0000
Residual	.441122067	15	.029408138	R-squared =	0.9936
-----+-----					
Adj R-squared = 0.9893					
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

. estat dwatson

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

ANNEX 2: Granger Causality Test for objective (2)

vargranger

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
	log_govtexp	log_exhr	.69632	2	0.706
	log_govtexp	log_infl	5.2839	2	0.031
	log_govtexp	log_gdp	7.5197	2	0.023
	log_govtexp	ALL	19.215	14	0.157

```

562 |-----+-----|
563 | log_privp log_govtexp | 21.327 2 0.000 |
564 | log_privp log_pexp | 16.187 2 0.000 |
565 | log_privp log_unemr | 15.966 2 0.000 |
566 | log_privp log_gfcap | 3.3892 2 0.184 |
567 | log_privp log_exhr | 10.33 2 0.006 |
568 | log_privp log_infl | 2.9378 2 0.230 |
569 | log_privp log_gdp | 18.935 2 0.000 |
570 | log_privp ALL | 93.804 14 0.000 |
571 |-----+-----|
572 | log_pexp log_govtexp | 5.33 2 0.070 |
573 | log_pexp log_privp | 3.4607 2 0.177 |
574 | log_pexp log_unemr | 10.86 2 0.004 |
575 | log_pexp log_gfcap | 3.1747 2 0.204 |
576 | log_pexp log_exhr | 1.4257 2 0.490 |
577 | log_pexp log_infl | 3.6782 2 0.159 |
578 | log_pexp log_gdp | 9.7205 2 0.008 |
579 | log_pexp ALL | 115.59 14 0.000 |
580 |-----+-----|
581 | log_unemr log_govtexp | 14.997 2 0.001 |
582 | log_unemr log_privp | 9.6275 2 0.008 |
583 | log_unemr log_pexp | 10.548 2 0.005 |
584 | log_unemr log_gfcap | 32.905 2 0.000 |
585 | log_unemr log_exhr | 4.687 2 0.096 |
586 | log_unemr log_infl | 4.9367 2 0.085 |
587 | log_unemr log_gdp | 7.1875 2 0.027 |
588 | log_unemr ALL | 145.95 14 0.000 |
589 |-----+-----|
590 | log_gfcap log_govtexp | 1.2455 2 0.536 |
591 | log_gfcap log_privp | .07131 2 0.965 |
592 | log_gfcap log_pexp | .98719 2 0.610 |
593 | log_gfcap log_unemr | 1.5577 2 0.459 |
594 | log_gfcap log_exhr | 2.8005 2 0.247 |
595 | log_gfcap log_infl | 1.353 2 0.508 |
596 | log_gfcap log_gdp | 3.9925 2 0.136 |
597 | log_gfcap ALL | 64.919 14 0.000 |
598 |-----+-----|
599 | log_exhr log_govtexp | 4.2546 2 0.119 |
600 | log_exhr log_privp | 2.1235 2 0.346 |
601 | log_exhr log_pexp | 7.8201 2 0.020 |
602 | log_exhr log_unemr | 4.3524 2 0.113 |
603 | log_exhr log_gfcap | 4.1266 2 0.127 |
604 | log_exhr log_infl | .13072 2 0.937 |
605 | log_exhr log_gdp | 4.6604 2 0.097 |
606 | log_exhr ALL | 71.911 14 0.000 |
607 |-----+-----|
608 | log_infl log_govtexp | 1.6095 2 0.500 |
609 | log_infl log_privp | 29.004 2 0.000 |
610 | log_infl log_pexp | 10.319 2 0.006 |
611 | log_infl log_unemr | 14.897 2 0.001 |
612 | log_infl log_gfcap | 6.4846 2 0.039 |
613 | log_infl log_exhr | 16.437 2 0.000 |
614 | log_infl log_gdp | 24.206 2 0.000 |
615 | log_infl ALL | 138.62 14 0.000 |
616 |-----+-----|
617 | log_gdp log_govtexp | 19.108 2 0.000 |
618 | log_gdp log_privp | 19.439 2 0.000 |
619 | log_gdp log_pexp | 14.904 2 0.001 |
620 | log_gdp log_unemr | 26.712 2 0.000 |
621 | log_gdp log_gfcap | 8.4444 2 0.015 |
622 | log_gdp log_exhr | 30.539 2 0.000 |
623 | log_gdp log_infl | 9.6364 2 0.008 |
624 | log_gdp ALL | 96.692 14 0.000 |
625 |-----+-----|

```

```

626 Unit Root Test
627 log_govtexp ~ I(1)
628 . dfuller d.log_govtexp

```

```

629 Dickey-Fuller test for unit root          Number of obs =    25
630 ----- Interpolated Dickey-Fuller -----
631      Test      1% Critical    5% Critical    10% Critical
632      Statistic Value         Value         Value
633 -----
634 Z(t)      -7.671      -3.750      -3.000      -2.630
635 -----
636 MacKinnon approximate p-value for Z(t) = 0.0000
637 log_gdp ~ I(1)
638 . dfuller d.log_gdp
639 Dickey-Fuller test for unit root          Number of obs =    25
640 ----- Interpolated Dickey-Fuller -----
641      Test      1% Critical    5% Critical    10% Critical
642      Statistic Value         Value         Value
643 -----
644 Z(t)      -3.616      -3.750      -3.000      -2.630
645 -----
646 MacKinnon approximate p-value for Z(t) = 0.0055
647 log_infl ~ I(1)
648 . dfuller d.log_infl
649 Dickey-Fuller test for unit root          Number of obs =    25
650 ----- Interpolated Dickey-Fuller -----
651      Test      1% Critical    5% Critical    10% Critical
652      Statistic Value         Value         Value
653 -----
654 Z(t)      -5.074      -3.750      -3.000      -2.630
655 -----
656 MacKinnon approximate p-value for Z(t) = 0.0000
657 log_exhr ~ I(1)
658 . dfuller d.log_exhr
659 Dickey-Fuller test for unit root          Number of obs =    25
660 ----- Interpolated Dickey-Fuller -----
661      Test      1% Critical    5% Critical    10% Critical
662      Statistic Value         Value         Value
663 -----
664 Z(t)      -4.395      -3.750      -3.000      -2.630
665 -----
666 MacKinnon approximate p-value for Z(t) = 0.0003
667 log_gfcap ~ I(1)
668 . dfuller d.log_gfcap
669 Dickey-Fuller test for unit root          Number of obs =    25
670 ----- Interpolated Dickey-Fuller -----
671      Test      1% Critical    5% Critical    10% Critical
672      Statistic Value         Value         Value
673 -----
674 Z(t)      -3.753      -3.750      -3.000      -2.630
675 -----
676 MacKinnon approximate p-value for Z(t) = 0.0034
677 log_pexp ~ I(1)
678 . dfuller d.log_pexp
679 Dickey-Fuller test for unit root          Number of obs =    25
680 ----- Interpolated Dickey-Fuller -----
681      Test      1% Critical    5% Critical    10% Critical
682      Statistic Value         Value         Value
683 -----
684 Z(t)      -9.497      -3.750      -3.000      -2.630
685 -----
686 MacKinnon approximate p-value for Z(t) = 0.0000
687 log_unemr ~ I(1)
688 . dfuller d.log_unemr
689 Dickey-Fuller test for unit root          Number of obs =    25
690 ----- Interpolated Dickey-Fuller -----
691      Test      1% Critical    5% Critical    10% Critical
692      Statistic Value         Value         Value
693 -----
694 Z(t)      -6.963      -3.750      -3.000      -2.630
695 -----

```

```

696 MacKinnon approximate p-value for Z(t) = 0.0000
697 log_privp ~ I(1)
698 dfuller d.log_privp
699 Dickey-Fuller test for unit root          Number of obs =    25
700          ----- Interpolated Dickey-Fuller -----
701          Test      1% Critical    5% Critical    10% Critical
702          Statistic Value         Value         Value
703 -----
704 Z(t)      -5.983      -3.750      -3.000      -2.630
705 -----
706 MacKinnon approximate p-value for Z(t) = 0.0000
707 Cointegration Test
708 dfuller uhat
709 Dickey-Fuller test for unit root          Number of obs =    25
710          ----- Interpolated Dickey-Fuller -----
711          Test      1% Critical    5% Critical    10% Critical
712          Statistic Value         Value         Value
713 -----
714 Z(t)      -2.240      -3.750      -3.000      -2.630
715 -----
716 MacKinnon approximate p-value for Z(t) = 0.1921
717

```

718 Econometric Tests
 719 Correlation Matrix
 720 . correlate log_govtexp log_privp log_pexp log_unemr log_gfcap log_exhr log_infl log_gdp l1.log_privp l1.log_govtexp
 721 l1.log_gdp
 722 (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

723
 724 Normality Test
 725 mvtest normality log_govtexp log_privp log_pexp log_unemr log_gfcap log_exhr log_infl log_
 726 Test for multivariate normality

727 Doornik-Hansen chi2(14) = 2.2251 Prob>chi2 = 0.0367

728 Heteroskedasticity Test
 729 estat imtest, white

730 White's test for Ho: homoskedasticity
 731 against Ha: unrestricted heteroskedasticity

732
 733
 734 chi2(25) = 16.00
 735 Prob > chi2 = 0.0407

736
 737 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

747
 748
 749 Specification Error Test

750 estat ovtest

751 Ramsey RESET test using powers of the fitted values of log_govtexp

752 Ho: model has no omitted variables

753 F(3, 12) = 2.55
 754 Prob > F = 0.1048
 755