

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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37 **Key Words:** *Privatization; Fiscal Policy; Macroeconomic Variable; Government Expenditure*
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1. INTRODUCTION

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

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

To address these emerging imbalances, intensification of privatization and commercialization of Nigeria's public enterprises was embraced as one of options in line with the Structural Adjustment Programme (SAP) policy. Upon this, a broad range of objectives have been put forward by governments to justify privatization, although the priority given to each has "varied both 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 argued 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 investment locally. It reflects the

77 government's commitment to economic reform and a positive image to attract foreign
78 investment, also it helps to develop the capital market, create new mechanisms for
79 mobilizing capital and attracting national capital outside the country. It can also enhance
80 employment opportunities, optimizing the use of the national work force, and ensuring the
81 continued equitable increase of individual income.

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

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

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

- 107 • H_{01} : There is no significant impact of privatization process and selected macro-
108 economic aggregates on fiscal policy in Nigeria.

- 109 • **H₀₂:** There is no causal relationship among privatization proceed, fiscal and macro-
110 economic variables in Nigeria.

111 **Theoretical and Empirical Literature;**

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

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

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

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

166 **Barnett (2000)** use panel data analysis to find the fiscal and macro-economic impact of
167 privatization on Transition and Non-transition countries, one of his major findings is that
168 privatization proceeds transferred to the budget tend to be saved. Specifically, they were
169 used to reduce domestic financing, and debt stock, while on the other hand total privatization
170 proceed is correlated with an improved macroeconomic aggregates. While **Birch and Haar**
171 **(2000)** did a descriptive study of the privatization experience in the last two decades in
172 Argentina, Brazil, Chile, Colombia, Mexico, Peru, Venezuela and some Caribbean countries;
173 **they found positive effects** of privatization on short and long-run macroeconomic conditions-
174 which revealed a positive effect of privatization on productivity and a negative effect on
175 employment. **Jerónimo (2003)** writes on "Privatization **in** European Economic and Monetary
176 Union" using panel data analysis to examine whether privatization receipts have been used

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

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

204 **2. METHODS**

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

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

215 2.1 Model Specification

216 i. Unit-Root Test:

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

$$222 \quad \Delta Y_t = \theta_o + \theta_1 Y_{t-1} + \sum_{i=1}^k b_i \Delta Y_{t-i} + \mu_t \dots\dots\dots (1)$$

223 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
 224 the white noise at time while k and Δ remain as defined in equation (6) above. This we will
 225 achieve, conducting the test by first or second level difference if the series are integrated of
 226 order one or order two (i.e. I(1) or I(2)). The null hypothesis here is that Y_t has a unit root
 227 (that is, non-stationary) and the alternative is that there is no unit root (that is, stationary). If
 228 the variables turn out to contain unit roots, we will therefore, conclude that they are non-
 229 stationary.

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

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

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

241

242 • **Functional Specification:**

243 **GOVTEXP = f(PRIVP, PEXP, UNEMR, GFCAP, EXHR, GDP) (2)**

244 Equation (1) describes fiscal policy, proxied by government expenditure (GOVTEXP) as a
245 function of PRIVP, PEXP, UNEMR, GFCAP, EXHR, INFL and GDP.

246 where, GOVTEXP = Government Expenditure

247 PRIVP = Privatization Proceed

248 PEXP = Per capita Expenditure

249 UNEMR = Unemployment Rate

250 GFCAP = Gross Fixed Capital Formation

251 EXHR = Exchange Rate,

252 GDP = Gross Domestic Product

253 and f = functional notation..

254 • **Econometric form of the ARDL Model**

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

258 **GOVTEXP_t = b₀ + b₁PRIVP_t + b₂PEXP_t + b₃UNEMR_t + b₄GFCAP_t + b₅EXHR_t + b₆INFL_t +**
259 **b₇GDP_t + b₈GOVTEXP_{t-1} + b₉PRIVP_{t-1} + b₁₀PEXP_{t-1} + b₁₁UNEMR_{t-1} +**
260 **b₁₂GFCAP_{t-1} + b₁₃EXHR_{t-1} + b₁₄INFL_{t-1} + b₁₅GDP_{t-1} + μ (3)**

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

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

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

272
$$Y_t = \beta_o + \sum_{k=1}^m \beta_k Y_{t-K} + \sum_{P=1}^n \alpha_P X_{t-P} + \mu_t \dots\dots\dots (5)$$

273
$$X_t = \gamma_o + \sum_{k=1}^m \lambda_k Y_{t-K} + \sum_{P=1}^n \gamma_P X_{t-P} + V_t \dots\dots\dots (6)$$

274 where; Y_t and X_t are the variables μ_t and V_t are the mutual uncorrelated error terms, t
275 denotes time and K and P are the number of lags. The null hypothesis is $\alpha_p = 0$ for all P 's
276 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
277 some P 's and K 's. If the coefficient α_p 's are statistically significant while, λ_k 's are not,
278 then X is said to cause Y . On the other hand, if λ_k 's are statistically significant while α_p 's
279 are not, then Y is said to cause X (uni-directional causality). However, if both α_p and λ_k are
280 statistically significant, then causality is said to run both sides which is known as bilateral or
281 bi-directional causality. We adopt a Granger causality Wald test for this purpose. In this
282 case, if the probability of the computed Chi²-value is sufficiently low (less than 0.05) we
283 reject the null hypothesis, and accept if otherwise.

284 • Variable Definition

285 **Privatization Variable (PRIVP):** Privatization Proceed refers to funds that are accruing to
286 government as a result of change in ownership of government investment in public
287 enterprises. It has been variously been used by Plane (1997), Cook and Uchida, (2003).
288 Boubakri et al, (2004) and privatization related studies. Plane (1997), Cook and Uchida
289 (2003) and Barnett (2000) argued that total privatization proceed is a good proxy in
290 accessing the relationship between it and other macro-economic variables. Its economic
291 relationship with government expenditure is positive.

292 **Government Expenditure (GOVTEXP):** is government spending incurred by central, state
293 and local governments of a country in a bid to satisfy the collective social wants of the
294 people. A fiscal crisis is a major determinant of; if not a necessary condition for the decision
295 to privatize public enterprises. Privatization is perceived a part of fiscal solution. Since it
296 provides revenue that can be used to offset deficit and free government from the burden of
297 subsidizing loss-making state enterprises. Eliminating subsidies given to state enterprises
298 has a clear positive impact. In many cases, government has used revenues from
299 privatization to reduce the stock of public debt, but the ultimate use of privatization revenues
300 is a function of the overall fiscal performance of government (see Katsolakos 2003, Barnett
301 2000, and IMF 2000)

302 ▪ Source of Data

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

306 ▪ Software Packages

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

308 3. RESULTS ;

309 The unit root test result indicates that all variables (log_govtexp, log_gdp, log_infl, log_exhr,
310 log_gfcap, log_pexp, log_unemr, and log_privp) are all integrated of order (1). This is
311 because the absolute values of their computed ADF test statistics are greater than the
312 absolute value of their tabulated ADF critical values at their level form given 5% level of
313 significance. The unit root is tested with trends and intercept at level form but the result
314 indicates that both the trends and intercepts are insignificant. log_govtexp, log_gdp, log_infl,
315 log_exhr, log_gfcap, log_pexp, log_unemr and log_privp are not stationary at level with
316 insignificant trend and intercepts but are stationary at 1st difference. Hence, they are
317 integrated of order one I(1). The result is summarized in table 3.1 below.

318 **Table 3.1 Summary of Unit Root Test Result**

Variables	ADF t-statistics	5% Critical Value	Order of Integration
D.log_govt. expenditure	-7.671	-3.000	1(1)
D.Log_gross domestic product	-3.616	-3.000	1(1)
D.log_inflation	-5.074	-3.000	1(1)
D.log_exchange rate	-4.395	-3.000	1(1)
D.log_gross fixed capital formation	-3.753	-3.000	1(1)
D.log_per capita expenditure	-9.497	-3.000	1(1)
D.log_unemployment rate	-6.963	-3.000	1(1)
D.log_privatization proceed	-5.983	-3.000	1(1)

319

320 • Cointegration Test:

321 In order to investigate whether there exist long run relationship among the variables using
322 the Augmented Dickey-Fuller (ADF) cointegration test at 5% level of significance. The result
323 reveals that all variables do not have long run relationship with log_govtexp. This implies that
324 they are not cointegrated (see Appendix for result). This is because, the absolute value of
325 the computed Augmented Dickey-Fuller test statistic (-2.240) is less than the tabulated
326 Augmented Dickey-Fuller statistic (-3.000) at 5% level of significance. Therefore, there is no
327 cointegration among the variables.

328

329 • Presentation of (ARDL) Regression Result for Objective (1)

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

335

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

Variables	Coefficient	Std.Error	t-stat	P>t
log_privatization proceed	0.1341561	0.0513699	2.61	0.020
log_per capita expenditure	0.3087684	0.1196755	2.58	0.021
log_unemployment rate	-1.1260860	0.4343606	-2.59	0.020
log_gross fixed capital formation	-0.4561435	0.1682508	-2.71	0.016
log_exchange rate	0.3404659	0.1261501	-2.71	0.016
log_inflation	-0.0960605	0.0671134	-1.43	0.173
log_gross domestic product	-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

337
 338 From the above table, a percentage increase in privatization proceed (log_privp), increases
 339 government expenditure (log_govtexp) significantly by about 13.49%. A percentage change
 340 in per capita expenditure (log_pexp) brings about a 30.9 percentage significant increase in
 341 Nigeria government's expenditure (log_govtexp). A percentage rise in unemployment rate in
 342 Nigeria (log_unemr) has about 112.6% significant decrease in Nigerian government's
 343 expenditure (log_govtexp). More so, a percentage rise in gross fixed capital formation
 344 (log_gfcap), leads a 45.6% significant decrease on government expenditure (log_govtexp) of
 345 Nigeria. However, a percentage increase in exchange rate (log_exhr) brings about a 34%
 346 significant increase in government expenditure (log_govtexp) of Nigeria. A percentage
 347 increase in inflation rate (log_infl) leads to about 9.6% significant decrease in government
 348 expenditure (log_govtexp). In addition to the above, a percentage increase in gross domestic
 349 product (log_gdp) leads to about 44.8% insignificant decrease in government expenditure
 350 (log_govtexp).
 351 However, percentage increases in previous years' privatization proceed (log_privpL1.)
 352 decreases Nigeria's current government expenditure (log_govtexp) insignificantly by about
 353 6.3%. A percentage change in previous years' government expenditure (log_govtexpL1.),
 354 brings about a 40.2% significant increase in Nigeria's current government expenditure
 355 (log_govtexp). Also, a percentage change in previous years' gross domestic product
 356 (log_gdpL1.) brings about 58.2% significant increases in government's current expenditure
 357 (log_govtexp). This is true since Nigeria's GDP is constantly increasing and budget has
 358 been on incremental basis. Moreover, the constant term is positively related to government
 359 current expenditure (log_govtexp) and a unit increase in it increases government current
 360 expenditure (log_govtexp) by about 9.588 units. Here we restrict the ARDL result without

proceeding to ECM since there is no evidence of cointegration among the variables. Objective (1) is therefore, considered only in its long run steady state relations.

363

364 • **Causal Relationship (Granger Causality Wald test) Result for Objective**
365 **(2)**

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

369 **Table 3.3; Summary of Granger Causality Result**
370

Lead Variables	Decision
log_government.expenditure	granger-causes log_infl and log_gdp only
log_privatization proceed	granger-causes log_govtexp, log_pexp, log_unemr, log_exhr and log_gdp except log_infl
log_per capita expenditure	granger-causes log_unemr and log_gdp only
log_unemployment rate	granger-causes log_govtexp, log_privp, log_pexp, log_gfcap except log_exhr and log_infl
log_gross fixed cap. formation	granger-causes None
log_exchange rate	granger-causes log_pexp only
log_inflation	granger-causes log_privp, log_pexp, log_unemr, log_gfcap, log_exhr except log_govtexp
log_gross domestic product	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

371

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

379 log_unemr, log_infl and log_gfcap, log_infl and log_exhr, log_gdp and log_gfcap, and
380 log_gdp and log_exhr.

381

382 3.1 Discussion

383 • Policy Implication of ARDL Model Result:

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

403

404 • Policy Implication of Causality Wald Test Result:

405 The causality test result showed that privatization (log_privp) leads growth in log_govtexp,
406 log_pexp, log_unemr, log_exhr and log_gdp except log_infl with a feedback relationship
407 from log_unemr and log_gdp. Log-govtexp on the other hand, leads growth in log_infl and
408 log_gdp only. The implication is that, privatization cause's growth in all macro-economic
409 variables under study except inflation. Though, privatization does not necessarily have to
410 take place first before the macroeconomic variables grow. It is expected that privatization will
411 induce efficiency in the system and consequently reduce unemployment in the country. For
412 inflation (log_infl), one would expect an increase in money supply as a result of lump sum of
413 money from privatized firms, which would in effect cause increase in general price level. The

outcome here suggests that the monetary authorities especially, the central bank took preventive measures within the period under review to avert increases in general price levels 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 privatization. The causal feedback from unemployment (log_unemr) to privatization is in line with economic expectation since increase in unemployment suggests that public enterprises are not efficient enough to expand and generate employment for the country's teeming 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 revealed that privatization impacted 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 we conclude given the obtained results, that the intensification of privatization of public enterprises should make the country better off.

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515
516 **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
L1.	.4018036	.1533702	2.62	0.019	.0749028 .7287044
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	
-----+-----					
log_privp	log_govtexp	21.327	2	0.000	

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

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622 Unit Root Test
623 log_govtexp ~ I(1)
624 . dfuller d.log_govtexp
625 Dickey-Fuller test for unit root          Number of obs =    25
626 ----- Interpolated Dickey-Fuller -----

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Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-7.671	-3.750	-2.630

MacKinnon approximate p-value for Z(t) = 0.0000

log_gdp ~ I(1)

. dfuller d.log_gdp

Number of obs = 25

Interpolated Dickey-Fuller

Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-3.616	-3.750	-2.630

MacKinnon approximate p-value for Z(t) = 0.0055

log_infl ~ I(1)

. dfuller d.log_infl

Number of obs = 25

Interpolated Dickey-Fuller

Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-5.074	-3.750	-2.630

MacKinnon approximate p-value for Z(t) = 0.0000

log_exhr ~ I(1)

. dfuller d.log_exhr

Number of obs = 25

Interpolated Dickey-Fuller

Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-4.395	-3.750	-2.630

MacKinnon approximate p-value for Z(t) = 0.0003

log_gfcap ~ I(1)

. dfuller d.log_gfcap

Number of obs = 25

Interpolated Dickey-Fuller

Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-3.753	-3.750	-2.630

MacKinnon approximate p-value for Z(t) = 0.0034

log_pexp ~ I(1)

. dfuller d.log_pexp

Number of obs = 25

Interpolated Dickey-Fuller

Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-9.497	-3.750	-2.630

MacKinnon approximate p-value for Z(t) = 0.0000

log_unemr ~ I(1)

. dfuller d.log_unemr

Number of obs = 25

Interpolated Dickey-Fuller

Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-6.963	-3.750	-2.630

MacKinnon approximate p-value for Z(t) = 0.0000

log_privp ~ I(1)

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

```

714 Econometric Tests
 715 Correlation Matrix
 716 . correlate log_govtexp log_privp log_pexp log_unemr log_gfcap log_exhr log_infl log_gdp l1.log_privp l1.log_govtexp
 717 l1.log_gdp
 718 (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

719
 720 Normality Test
 721 mvtest normality log_govtexp log_privp log_pexp log_unemr log_gfcap log_exhr log_infl log_gdp
 722 Test for multivariate normality

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

724 Heteroskedasticity Test
 725 estat imtest, white

726
 727 White's test for Ho: homoskedasticity
 728 against Ha: unrestricted heteroskedasticity

729
 730 chi2(25) = 16.00
 731 Prob > chi2 = 0.0407

732
 733 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

744
 745 Specification Error Test
 746 estat ovtest
 747 Ramsey RESET test using powers of the fitted values of log_govtexp
 748 Ho: model has no omitted variables
 749 F(3, 12) = 2.55
 750 Prob > F = 0.1048
 751