

# Effectiveness of Fiscal Federalism for Poverty Reduction in Nigeria: An Analysis of Federal and State Governments' Expenditures

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## Research

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1           **Effectiveness of Fiscal Federalism for Poverty Reduction in Nigeria: An Analysis of**  
2                                   **Federal and State Governments' Expenditures**

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13  
14           **Abstract**

15   One of the sustained political and economic strategies that have been adopted by various countries over three  
16   decades to achieve the desired level of development is fiscal federalism. Through this economic development  
17   strategy, various levels of government within an economy have been involved in the pursuit of reducing poverty  
18   over the decades. The purpose of this study is to examine the relationship between government expenditure on  
19   poverty reduction with respect to federal and state government expenditures respectively. The study employed the  
20   auto-regressive distributed lag (ARDL) estimation technique to establish long-run relationship, and to examine  
21   the magnitude of the effect of federal and state government expenditures in both the short-run and long-run  
22   periods using time-series data for the period 1981 to 2018. Results obtained indicate that only state government  
23   expenditure has positive effect on poverty reduction in Nigeria. The findings of this study therefore support the  
24   need for greater decentralization and increase in fiscal expenditure responsibilities and strengthening revenue  
25   capability in favor of state governments, giving that achieving desired poverty reduction could be achieved  
26   through increased state government spending.

27  
28   **Key words:** Poverty Reduction, Government Expenditure, Fiscal Decentralization, ARDL,  
29   Nigeria.

30   **JEL Classification:** E62, H50, I30

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48 **1. Introduction**

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50 Theoretically, the Keynes School of thought argues that government's fiscal policy especially  
51 her expenditure is a tool for stabilizing the economy, improving economic performance and  
52 welfare. This argument is based on the premise that government spending has impact on  
53 output, employment, productivity, and income (Keho, 2019). For example, government  
54 spending on infrastructure can increase employment through entrepreneurship and awarded  
55 projects. This will further increase disposable income, increase aggregate demand, increase  
56 private consumption and eventually lead to an improved welfare or reduced poverty.  
57 Similarly, governments spending on health and education have the potential to increase  
58 efficiency and productivity which often translate to better income, private consumption,  
59 leading to a desirably improved welfare. In essence, the role of government in economic  
60 growth and development process remain undisputable.

61 One of the sustained political and economic strategies that have been adopted by various  
62 governments over three decades to achieve the desired level of development is federalism.  
63 Federalism is a system of governance that comprises of multi-ordered government levels  
64 (local government, state government and central government) which make-up the general  
65 government, with a certain degree of independence of the government units (Dziobek et al.,  
66 2011). In this system of governance, power, duties, rights, privileges and decision-making  
67 responsibilities regarding generation, allocation and utilization of financial resources, and the  
68 provision and distribution of public goods according to Agyeman-Duah et al., (2018) are  
69 shared among each of the governance units. The argument for federalism is on the logic that  
70 through its governance is brought closer to the people both spatially and institutionally, and  
71 government will be more knowledgeable about and responsive to the needs of the people  
72 (Crook, 2003).

73 Globally, while there is a wide agreement regarding efficiency and benefits of fiscal  
74 federalism, the question in the Nigerian case remain about the effectiveness of expenditure  
75 responsibilities of each of the levels of government in the country. This is imperative because  
76 as of late governments fiscal in Nigeria has expanded greatly, however, social indicators  
77 especially employment, education and health are not improving significantly; poverty rate also  
78 has been on the increase. Nigeria is categorized as a lower-middle income country, and it is  
79 one of the countries in the sub-Saharan Africa region that has been struggling with serious  
80 problem of poverty. According to the National Bureau of Statistics (2019), about 40 percent

81 (83 million people) are poor because they live below the poverty line of \$381.75 per year, this  
82 make Nigeria to be considered as the poverty capital of the world. Collaborating this is the  
83 United Nations (UN) annual Human Development Index (HDI), which categorized Nigeria  
84 among countries with low human development index for more than a decade, and currently  
85 has low index of 0.534. This extent of poverty situation in the country is paradoxical in nature  
86 in that despite the abundant revenue from oil resource, a lot of people are considered deprived  
87 and poor, and this further put a question on the relative impact of government fiscal efforts on  
88 the welfare on the citizens. The aim of this study therefore is to investigate the impact of  
89 government expenditure on poverty in Nigeria, by taking into consideration the federal system  
90 of governance operating in the country. Specifically, the objective of the study is to estimate  
91 the long- and short-run impact of federal and state government expenditures responsibilities on  
92 poverty reduction. Rest of the paper is organized as follows; second section of the paper  
93 present fiscal decentralization structure in Nigeria, relevant empirical literature is presented in  
94 section three, section four describes data and analytical techniques used in the study. In the  
95 fifth section, empirical results and discussion are presented and the last section presents  
96 conclusion and policy recommendations.

97

## 98 **2. Federalism Structure and Government Expenditure Trend in Nigeria**

99

100 The fiscal structure of Nigeria is influenced by the system of governance which is according to  
101 the Nigerian constitution. Specifically, Nigeria operates a federal system of governance, which  
102 is a system of governance that comprises of multi-ordered tiers of governments (local  
103 government, state government and central government) which make-up the general  
104 government, with a certain degree of independence of the government units (Dziobek et al.,  
105 2011). Nigeria's federal system of governance grew from 3 regions during the period 1960-  
106 1966 to 12 states by 1967, and currently to 36 states and the federal capital territory (FCT).  
107 Equally, the number of Local Government areas (LGAs) now 774 had risen from 301 between  
108 the years 1976 to 774. In this system of governance, power, duties, rights, privileges and  
109 decision-making responsibilities for the supply of public services are shared among each of the  
110 governance units (Khemani, 2001). Like many African countries, Nigeria has an astoundingly  
111 decentralized system of government and a significant part of the essential responsibilities of  
112 government such as education and health are decentralized to the other levels of government  
113 (Dada, 2015).

114

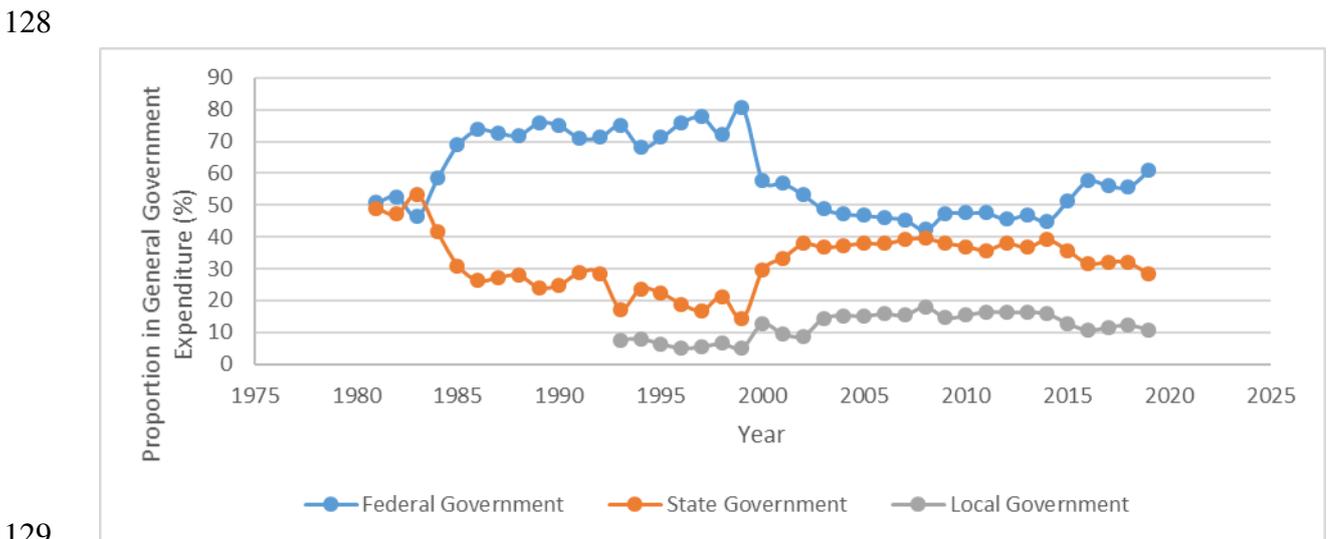
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116 Table 1: Responsibilities of Different Government Units/Levels in Nigeria

Tier of Government	Expenditure Category
Federal (Central)	Defense; Shipping; Federal trunk roads; Aviation; Railways; Posts, telegraph and telephones; Police and other security services; Regulation of labor, interstate commerce, telecommunication; Mines and minerals; Social Security; Insurance; National statistical system; National Parks; Guidelines for minimum education standards at all levels; Water resources affecting more than one state;
Federal and State	Antiquities and monuments; Electricity; Industrial, commercial and agricultural development; Scientific and technological research; Statistics and surveys; University, technological and post-primary education; Health and social welfare.
State and Local	Primary, adult and vocational education; Health services; Development of agriculture and non-mineral natural resources.
Local	Economic planning and development; Cemeteries; Homes for the destitute and infirm; Markets; Sewage and refuse disposal; Roads, streets and street lighting, drains, other public facilities.

117 Source: Khemani (2001)

118  
 119 The Nigeria government general expenditure have grown tremendously over the past 20  
 120 years. The need to meet development demand arising from population dynamics and  
 121 explosion, spatial expansion and infrastructural development are among several factors that  
 122 have necessitated an increasing government expenditure. The general government expenditure  
 123 grew from ₦254,8851 billion in the year 1993 to about ₦13998,31 in 2019 (CBN, 2020).  
 124 However as seen in Figure 1, the federal government account for about 75 percent of total  
 125 expenditure in 1993 and 61 percent in 2019. The figure clearly shown that the trend of share of  
 126 central government spending in the general government expenditure has been higher than the  
 127 state government share over the years under consideration.



129 Figure 1: Trend in Federal (Central), State and Local Government Expenditure

130 Source: Authors

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### 137 **3. Brief Review of Relevant Literature**

138

139 Empirically, there is an abundance of literature that have examined the link between or effect  
140 of government expenditure on economic development domains which include; income,  
141 income inequality, poverty, public service delivery, education outcomes, health outcomes and  
142 human capital development among others, this focus on poverty (proxy by expenditure) and  
143 HDI in order to avoid excessive heterogeneity. In trying to fill a gap in literature in this area a  
144 structured but brief review of literature is conducted by focusing on three relevant areas, in  
145 that literature in this area can be categorized into three groups; i) studies focusing on aggregate  
146 government expenditure, ii) studies focusing on disaggregated government expenditure and iii)  
147 studies that captures fiscal federalism effect.

148 Under the first category, studies have mainly used actual government expenditure or  
149 government size which is government expenditure as a percentage of gross domestic product  
150 (GDP). Using DOLS, FMOLS and GMM techniques, Liu et al., (2020) demonstrated that  
151 increase in government expenditure reduces rural poverty incidence by about 20 percent in  
152 Pakistan between 1980 and 2017. Milovich (2018) included government expenditure as a  
153 control variable while examining relationship between aid and poverty for a sample of 64  
154 developing countries for the period 2000 and 2014. Result from the Two-Stage Least-Squares  
155 (2SLS) indicates that government consumption seems to be significantly associated with a  
156 decrease in both the income poverty gap and in the multidimensional poverty index (MPI). A  
157 panel DOLS estimation by Kizilkaya et al., (2015) indicates a 0.1 percent increase in human  
158 development as a result of one percent increase in public expenditure. The study further  
159 argued that the extent of the effect of public expenditure on poverty reduction depend on level  
160 of threshold reached and the component of such expenditures. Omar an Inaba (2020) also  
161 confirmed that for government expenditure could lower poverty rates following a negative  
162 though insignificant computed coefficient value from one-way error component fixed effect  
163 model and robust standard errors to address heteroskedasticity estimation techniques. Dhahri  
164 and Omri (2020) explored the relationship between FDI and poverty reduction for 50  
165 developing countries using Tobit regression estimations, with government expenditure  
166 incorporated as a control variable. The coefficient of government consumption was found to  
167 have a negative ( $\beta=-7.404$ ) and statistically significant impacts on the poverty headcount  
168 index at a 1% level. This implies that increasing government expenditure will significantly

169 reduce the proportion of individual below poverty line by about 7 percent. The findings of  
170 these five studies is however inconsistent with Huay et al., (2019), Kaidi and Mensi (2019).  
171 Applying System generalized method of moment (Sys-GMM), Huay et al., (2019) investigated  
172 the impact of remittances on human development in 66 developing countries from 1980 to  
173 2014 by incorporating government expenditure in the model. The significant but negative  
174 coefficient of government expenditure means that, when other variables are held constant,  
175 increased government expenditure rather than serve as a human development catalyst reduces  
176 it. Kaidi and Mensi (2019) revealed that the relationship between government's final  
177 consumption expenditure and household final consumption expenditure (a proxy for poverty)  
178 is negative at the 1% level for both democratic and autocratic governments. This imply that a  
179 lowered household final consumption expenditure as a result of increase in government  
180 expenditure is an increase in poverty level. In this case government expenditure is not a  
181 stimulant for improved welfare. Applying Common Correlated Effect Mean Group (CCEMG)  
182 estimating technique, Keho (2019) in-line with Huay et al., (2019), Kaidi and Mensi (2019)  
183 found that one percent growth in government consumption expenditure leads to a 0.10 percent  
184 decline in private consumption in examined ECOWAS countries. This is an indication of  
185 crowing out effect in the long-run and short-run periods. The study argued that this situation  
186 arises due to the crowding out effect of private consumption, and a negative wealth effect  
187 induced by increased government expenditure.

188 In the second group of studies, government expenditure's effectiveness was accessed based  
189 expenditure component, such that government expenditure was disaggregated into sectoral  
190 component. This is in line with the argument that the effectiveness of government spending on  
191 welfare is dependent on sectoral and component of the spending (Anderson et al., 2018). After  
192 applying an ARDL estimation technique, Ali et al., (2012) found government development  
193 expenditure and education expenditure was found to have significant effect on HDI in Pakistan  
194 whereas recurrent expenditure had negative and insignificant impact. The estimated effect of  
195 education expenditure is slightly higher than that of development expenditure in the study.  
196 Olopade et al., (2019) explored the effect of human capital expenditure proxy by education  
197 and health expenditures for 12 OPEC member-countries using Fully Modified Ordinary Least  
198 Square between the period 1980 to 2016. The study demonstrated that while public  
199 expenditure was shown to have a statically significant trickling down effect of poverty rate by  
200 about 1.5 percent, public expenditure on health performed otherwise by not having a  
201 statistically significant impact. Haque and Khan (2019) examined the effect sectoral  
202 government spending (education, housing and community, social security, public service,

203 health, defense, and economic services) on HDI in Saudi Arabia using multiple regression  
204 estimation technique. Among these seven expenditure components, only three (education,  
205 housing and community, social security) were found to have significant positive effect on HDI  
206 in the country. Education expenditure with the largest effect is identified as key factor that  
207 contributes in the development of the HDI.

208 Celikay and Gumus (2017) analyzed the relationship between social expenditure and poverty  
209 in Turkey using panel error correction models on data covering the period 2004–2011 obtained  
210 from 26 regions in Turkey. The study found a negative relationship between social  
211 expenditure and poverty in the short-run. The study further obtained a negative relationship  
212 between education expenditure and poverty, both in the short run and in the long run.  
213 Matekenya et al., (2020) public health expenditure has a negative coefficient in a majority of  
214 the models, which contradicts a priori expectations. The negative coefficient of public health  
215 expenditures may be indicative of inefficiencies in government spending which has been a  
216 problem for a number of African economies (Novignon, 2015). In an estimation conducted by  
217 Olugunde et al., (2020), government health expenditure was found to have a positive but  
218 insignificant relationship ( $\beta=0.179$ ;  $p< 0.17$ ) with HDI among a group of Crude Oil-Producing  
219 Countries in Africa. Adegboyo (2020) explored the relationship between the various  
220 component of government expenditure and national poverty index in Nigeria, and concluded  
221 that government recurrent expenditure on economic service, social and community, and  
222 transfer reduces poverty while poverty is escalated as a result of increase in recurrent  
223 expenditure on administration and transfers' capital expenditure.

224 Ogbonnaya-Udo and Chukwu (2020) investigated the effect of defence, education and health  
225 expenditures of government on HDI in a panel of five West African countries for the period  
226 2000-2018. The random effect result shows that the effect of expenditure differs, while  
227 expenditure on defence is negative and insignificant, the effect is positive for both education  
228 and health, it was only however significant for education ( $\beta=1.87E-11$ ;  $p< 0.05$ ). Ordinary  
229 least squares regression employed by Linhartová (2020), revealed that though HDI is positive  
230 and statistically significantly impacted by Czech Republic government expenditures on public  
231 order and safety, housing, health, education, and recreation, culture, and religion, their  
232 contribution are however extremely minute. Omari and Muturi (2015) study on Kenya show  
233 that government expenditure on agriculture and health has a positive and significant effect on  
234 private consumption per capita thereby leading to reduction of poverty level. A one per cent  
235 increase in government expenditure on agriculture and health leads to a 0.27 per cent and 1.45  
236 per cent respectively increase in private consumption per capita. Whereas the impact of

237 government expenditure on education was insignificant. Ruch and Geyer (2017) on South  
238 Africa concluded that regardless of the estimated models, additional investment in land,  
239 transportation infrastructure and specialized vehicles slightly increase poverty. Whereas  
240 expenditure on roads, sewerage, street lighting, community assets and electricity consistently  
241 contribute to poverty reduction efforts though marginally. Following the very negligible effect  
242 on poverty reduction, the authors questions the effectiveness of service delivery as a  
243 significant poverty alleviation tool.

244 The third group of studies considered the effectiveness of government expenditure on welfare  
245 by examining the effect of fiscal federalism which could be captured by fiscal decentralization  
246 or comparing different governance units' expenditure. Fiscal decentralization is  
247 conceptualized as the transfer of administrative authority and responsibilities from the national  
248 government to other lower government in an economy (Martinez-Vazquez and Lagon-Penas,  
249 2017; Udoh et al., 2015). According to Lledó et al., (2018), it captures the share of own fiscal  
250 components (revenue, expenditure, tax) of each of the levels of governments (central,  
251 state/province/region; and local) as a proportion of general government fiscal components.

252 A bivariate regression analysis conducted by Khanal (2018) in Nepal concluded that fiscal  
253 expenditure decentralization cannot promote human poverty reduction which comprises of  
254 deprivation in economic provisioning, life expectancy, percentage of people without access  
255 safe water. Findings from a normalized equation obtained through Johansen cointegration in  
256 the study of Mehmood et al., (2010) concluded that both revenue and expenditure  
257 decentralization have a very significant positive effect on human development index in  
258 Pakistan. However, the findings show that the magnitude of impact of revenue  
259 decentralization is higher than that of expenditure decentralization.

260 Also, Liu et al., (2019) examined the effect of fiscal decentralization on social welfare in  
261 China. From the analysis, the effect of fiscal decentralization in the central and western areas  
262 are significant and negative, while it is significant and positive through the turning point  
263 detection in the eastern area of China. Hadi and Nugroho (2018) finds fiscal decentralization  
264 to be significantly but negatively related to poverty which was proxy by the number of poor  
265 persons following a fixed effect estimate that was applied over panel data for the period 2009-  
266 2015 that obtained from 35 districts in Indonesia's central Java Province. The study finding  
267 showed that a with one percent increase in fiscal decentralization, the count of poor persons in  
268 the Central Java province will reduce by a very small percentage of about 0.003. The study is  
269 however in contradiction with Nursini and Tawakkal, (2019) who used three fiscal  
270 decentralization indicators to investigate the effect of fiscal decentralization on poverty

271 alleviation in same Indonesia. Fixed effect model was employed on data obtained from 33  
272 provinces in the country for the period 2010-2016. Main finding of the study is that while  
273 regional government revenues and intergovernmental transfers had a statistically significant  
274 effect on reducing poverty, regional government expenditures did not. The study argued that  
275 the concentration of regional government expenditure on administration proceedings limited  
276 the effect of expenditure on poverty reduction.

277 Tebogo et al., (2014) applied VAR and GMM to examine fiscal decentralization-poverty  
278 dynamic relationship using information from 8 metropolitan municipalities in South Africa.  
279 The study found a negative short-run effect of fiscal decentralization on real household  
280 consumption per capita, which consequently imply that fiscal decentralization in South Africa  
281 only promotes poverty rather than reducing it. Francisco and Canare (2018) together with  
282 other variables investigated the impact of fiscal decentralization on poverty incidence in  
283 Philippines. Findings from the two estimation techniques that were applied shows that fiscal  
284 decentralization have a positive effect on poverty alleviation. Specifically, the study found that  
285 the share of locally-sources revenues is associated with less poverty. Further examination  
286 revealed that higher poverty incidence is recorded when fiscal decentralization level increases  
287 beyond it optimal point. The result from Sepulveda and Martinez-Vazquez (2011) is however  
288 contrary to Francisco and Canare (2018) in that it found the share of income of local  
289 governments which is proxy for fiscal decentralization to be having significantly negative  
290 impact on poverty reduction of the 34 developing countries examined from 1970 to 2000.

291 Using GMM estimate over a data period from 1973 to 2013, Shahzad and Yasmin (2016)  
292 found fiscal decentralization to be having an increasing effect on poverty in Pakistan. The  
293 study shows that one-unit increase in expenditure decentralization lead to 2.7 percent increase  
294 in poverty, whereas for revenue decentralization poverty increases by 0.8 percent. The study  
295 of Banwo (2012) conducted on Nigeria found different impact of fiscal decentralization  
296 indicators on poverty incidence in Nigeria. Specifically, expenditure decentralization had an  
297 insignificant capability of increasing poverty.

298 From this brief empirical review, the varied dimensions, scope and focus on poverty together  
299 with different conceptualization and computation of government expenditure assessment have  
300 contributed to diverse findings on effectiveness of government expenditure. Moreover, it is  
301 observed that the effect of extent to which the central government retained fiscal power was  
302 not well-thought-out; fiscal decentralization was narrowly focused on aggregating subnational  
303 governance tiers such that the effect of each of the subnational government fiscal  
304 responsibilities was not considered. Hence, this study attempts to fill this gap by analyzing the

305 impact of fiscal federalism on poverty. This is carried out by comparatively investigating and  
306 analyzing the effectiveness of both central and state government expenditures on poverty in  
307 Nigeria.

308

#### 309 **4. Methodology**

310

##### 311 **4.1 Model Specification and Variables**

312

313 The study adopted a multivariate model specification following Ewetan et al., (2020) and  
314 Ugwuanyi et al., (2017) but incorporated different variables in the three models specifying the  
315 relationship between the variables of interest. The mathematical expression of the  
316 relationships is as follows:

317

$$318 \quad \ln Pov_t = \alpha_0 + \alpha_1 \ln FE_t + \alpha_2 \ln SE_t + \alpha_3 \ln FDI_t + e_t \dots \dots \dots (1)$$

319

320 Where  $\ln Pov_t$  is poverty indicator and it is represented by household consumption expenditure  
321 (Ugwuanyi et al., 2017). This study uses household final consumption expenditure per capita.  
322 This is because unlike income which is an indicator for potential in welfare improvement,  
323 consumption expenditure is a good proxy for achieved welfare for individuals and households.  
324 Besides, the documentation reliability and stability of consumption expenditure over time  
325 compare to income especially of poor people validate the use of consumption expenditure in  
326 this study. is reliably documented and quite stable when compared with their income  
327 (Odhiambo, 2010). Furthermore, the household final consumption expenditure is consistent  
328 with the definition of poverty by the World Bank as “the inability to attain a minimal standard  
329 of living” gauged relative to their basic consumption needs (World Bank 1990). The proxy has  
330 been used in poverty related study by Ugwuanyi et al.,( 2017)

331 Fiscal federalism is represented by both federal and state government expenditures. While  $FE$   
332 which is the proportion of federal or central government expenditure in total government  
333 expenditure and  $SE$  which is the proportion of the state government expenditure in total  
334 government expenditure. The control variable employed in the analysis is foreign direct  
335 investment inflow ( $FDI$ ). All variables are in natural logarithm form. Foreign direct  
336 investment is posited to enhance poverty reduction based on the spillover effect theory. These  
337 spillover effect include employment creation and increase in capital investment (Magombeyi  
338 and Odhiambo, 2018), development of local skills, increase economic growth with an overall  
339 revenue transfer (Magombeyi and Odhiambo, 2018; Ahmad et al., 2019). In short the impact

340 of *FDI* on poverty reduction can be both direct and indirect. From this study a positive  
 341 coefficient indicates increase in expenditure and consequently a reduction in poverty and vise-  
 342 versa.

343

#### 344 **4.2 Analytical Techniques**

345 This study utilized the ARDL estimation technique. The ARDL specification of empirical  
 346 model in eq. (1) is expressed as follows:

347

$$\begin{aligned} \Delta Pov_t &= \alpha_0 + \sum_{i=1}^n \alpha_{1i} \Delta \ln pov_{t-i} + \sum_{i=1}^n \alpha_{2i} \Delta \ln FE_{t-i} + \sum_{i=1}^n \alpha_{3i} \Delta \ln SE_{t-i} + \sum_{i=1}^n \alpha_{4i} \Delta \ln FDI_{t-1} + \delta_1 \ln pov_{t-1} \\ &+ \delta_2 \ln FE_{t-1} + \delta_3 \ln SE_{t-1} + \delta_4 \ln FDI_{t-1} + \varepsilon_{it} \dots \dots \dots (2) \end{aligned}$$

348

349

350

351 Following the ARDL cointegration test which is based on equation (2), the ARDL-based error  
 352 correction model of the general empirical models is also expressed as follows:

$$\begin{aligned} \Delta Pov_t &= \alpha_0 + \sum_{i=1}^n \alpha_{1i} \Delta \ln Pov_{t-1} + \sum_{i=1}^n \alpha_{2i} \Delta \ln FE_{t-1} + \sum_{i=1}^n \alpha_{3i} \Delta \ln SE_{t-1} + \sum_{i=1}^n \alpha_{4i} \Delta \ln FDI_{t-1} + \gamma_{1i} ECM_{t-1} \\ &+ \varepsilon_i \dots \dots \dots (3) \end{aligned}$$

353

354

355 Where  $\alpha_0$  is the constant,  $\alpha_{1i}$ -  $\alpha_{4i}$  are the respective short-run coefficients, *ECM* is the error  
 356 correction term, and  $\varepsilon_i$  is the white noise error term.

357

358 ARDL technique was employed because of it advantages over other cointegration techniques.  
 359 These advantages include; applicability irrespective of the order of integration of series though  
 360 order of integration should not be beyond order 1, useability with relatively small samples, and  
 361 possibility of simultaneously estimating long and short-run dynamics (Pesaran et al., 2001;  
 362 Ewetan et al., 2020; Demirhan, 2020).

363

#### 364 **4.3 Data Source**

365

366 This study is based annual time series data that cover the period from 1981 to 2018. Data for  
 367 the study are mainly secondary and they are obtained from the Central Bank of Nigeria and the  
 368 World Bank Group websites respectively. Total or general government, central (federal) and  
 369 state government expenditures were obtained from the CBN website, per capita household  
 370 consumption expenditure and foreign direct investment inflow data were obtained from the  
 371 World Bank Group website.

372

## 373 5. Results and Discussion

374

### 375 5.1. Unit Root Stationarity and Cointegration Tests

376

377 Following the criteria that intended variables needed to be integrated in the order of I(0) or  
 378 I(1) to so as to be able to apply the ARDL-Bound test cointegration technique, the integrated  
 379 orders of the variables were examined using the Philips-Perron (PP) and KPSS unit root test  
 380 measures, and results are presented in Table 2. As shown in the Table 2, there is a sufficient  
 381 reason to conclude that the level form of the series is not stationary. Consequently, the tests  
 382 were conducted at first-difference for each of the variables. The results of both PP and KPSS  
 383 tests indicate that the series are stationary at first difference at 1, 5 and 10 percent significance  
 384 levels respectively. This confirmed that none of the variables (*lnPov*, *lnFE*, *lnSE*, and *lnFDI*)  
 385 are integrated at order above I(1). This further confirm that the ARDL cointegration technique  
 386 can be applied on the data.

387 Table 2: Order of Integration Test

Variable	PP				KPSS	
	Level		First Difference		Level	First Difference
<i>lnPov</i>	-1.0001	0.7429	-7.4084	0.0000	0.6086	0.2169
<i>lnFE</i>	-1.1428	0.6883	-7.2233	0.0000	0.7179	0.2499
<i>lnSE</i>	-0.4227	0.8948	-3.5861	0.0111	0.7049	0.1654
<i>lnFDI</i>	-2.9939	0.0447	-9.7637	0.0000	0.2557	3.8265

388 Source: Computed by Authors

389 NB: KPSS significance level value are; 1% = 0.739000, 5% = 0.463000. 10% = 0.347000

390

391 As stated earlier, the Bound test cointegration technique was carried out to ascertain the  
 392 existence of cointegrating relationship among the variables or not in each of the model by  
 393 comparing the computed F-statistic with the critical values. The AIC was employed to  
 394 determine the optimal lag structure of the model of ARDL (1,1,1,0).

395 The result of the Bounds test for the model is presented in Table 3. The result shows that the  
 396 F-statistic of 8.21 for the model is higher than upper bound I(1) critical value at all levels of  
 397 significance. This result therefore warrants the rejection of the null hypothesis that there is  
 398 cointegration relationship existing among the regressands specified in equation 2, and  
 399 concluding that there is an existence of long-run relationship among the variables in each of  
 400 the model.

401 Table 3: Cointegration Test-ARDL Bound Test

Test Statistic	Value	Significance	I(0)	I(1)	Conclusion
F-Statistic	8.21	10%	2.37	3.2	Co-integration Exist

K	3	5%	2.79	3.67
		2.5%	3.15	4.08
		1%	3.65	4.66

402 *Source: Computed by authors*

403

## 404 5.2 ARDL long-run and ECM estimation results

405 Table 4 presents the results of both long-run and short-run estimations following the  
406 establishment of the existence of cointegration relationship among variables in each of the  
407 model. As shown in the Table 4, the error correction terms (ECT) for estimated short run  
408 period is; -0.818, this result indicates that each of the model will return to equilibrium with  
409 about 82 percent of adjustment taking place in the first year for model after a shock.

410 The effect of federal government expenditure on poverty reduction varies across period of  
411 time, while the effect is insignificant in the short-run, it is however found to be negative but  
412 significant ( $\beta=-0.23$ ;  $p<0.01$ ) in a longer period of time. The result means that in the long-run,  
413 there will be about 0.23 percent increase in poverty as a result of 1 percent increase in federal  
414 government expenditure when other variables are held constant. The coefficient of state  
415 government expenditure is positive and significant in the long-run ( $\beta=0.339$ ;  $p<0.01$ ), but  
416 positive and insignificant in the short-run. Specifically, in the long-run, one percent increase in  
417 the state government expenditure will lead to about 0.34 percent increase in household  
418 expenditure and by extension a reduction in poverty is achieved at the same proportion. The  
419 positive effect of state government expenditure validates the assertion and argument in favor  
420 of fiscal federalism and decentralization that local government will be more knowledgeable  
421 about and responsive to the needs of the people (Crook, 2003). Since, the state governments  
422 are closer to the masses and more knowledgeable of the need of the people than the federal  
423 government, they will as a result carry out expenditures that have positive impact on welfare  
424 in both the short and long-term. This finding is also in consistent with Francisco and Canare  
425 (2018), though Contrary to Banwo (2012) and Shahzad and Yasmin (2016). Beside the federal  
426 government not closer to the people, a further reason why increases in the proportion of  
427 federal government expenditure fail in poverty reduction is high level of corruption in the  
428 federal or central government and diversion of funds from welfare improving expenditures.

429

430 Table 4: Short-run and Long-run Coefficient Estimates, ARDL (1,1,1,0)

Variables	Coefficients	S.E
	<i>Short-run Estimate</i>	
$\Delta(\ln FE)$	0.0855	0.0637
$\Delta(\ln SE)$	0.0995	0.0647

<i>Ect</i>	-0.8177*	0.1199
	<i>Long-run Estimate</i>	
<i>LnFE</i>	-0.2322*	0.0623
<i>LnSE</i>	0.3385*	0.0580
<i>LnFDI</i>	-0.0101	0.0323
C	0.4970*	0.0829
R <sup>2</sup> = 0.62		
Durbin Watson= 2.06		
Jarque-Bera's Normality Test: 3.6016; Prob= 0.1652		
Breusch-Godfrey Serial Correlation LM Test: F-Statistic=0.2879;		
Prob. F (2,28)= 0.7521		
Heteroskedasticity-Breusch-Pagan-Godfrey: F-Statistic =0.6687;		
Prob. F (6,30)= 0.6755		

431 *Source: Computed by authors*

432

433 The control variable FDI, is found to be negative and statistically insignificant in the long-

434 run, this is contrary to the *a priori* expectation of this study. It suggests that FDI inflow in the

435 country does not have the potential of reducing poverty rather it increases it over the short and

436 long period of time. This negative impact of FDI inflow though contrary to *a priori*

437 expectation of study and the studies of Fowowe and Shuaibu (2014) and Ahmad et al., (2019),

438 it is however consistent with the findings of Huang et al., (2010), Ali et al. (2010) and Anetor

439 et al., (2020) that FDI inflows lead to an increase in poverty levels, which in this study is

440 through reduction in per capita expenditure. A possible explanation for this is the

441 noncomplementary nature of FDI with domestic firm (De Mello, 1999), near absolute

442 crowding out of domestic investment by foreign investment and high level of advanced

443 technology employed by foreign firms such that employment generation that could stimulate

444 consumption expenditure is impeded (Calvo and Hernandez, 2006; Magomgeyi and

445 Odhiambo, 2018).

446 Table 4 further present results of relevant post-estimation tests that were conducted in order to

447 affirm the soundness and reliability of the estimated models. The statistic report for the Jarque-

448 Bera test for normality validates the rejection of the null hypotheses that the estimated residual

449 series are not normally distributed. The Serial correlation LM test statistics of 0.287(0.75)

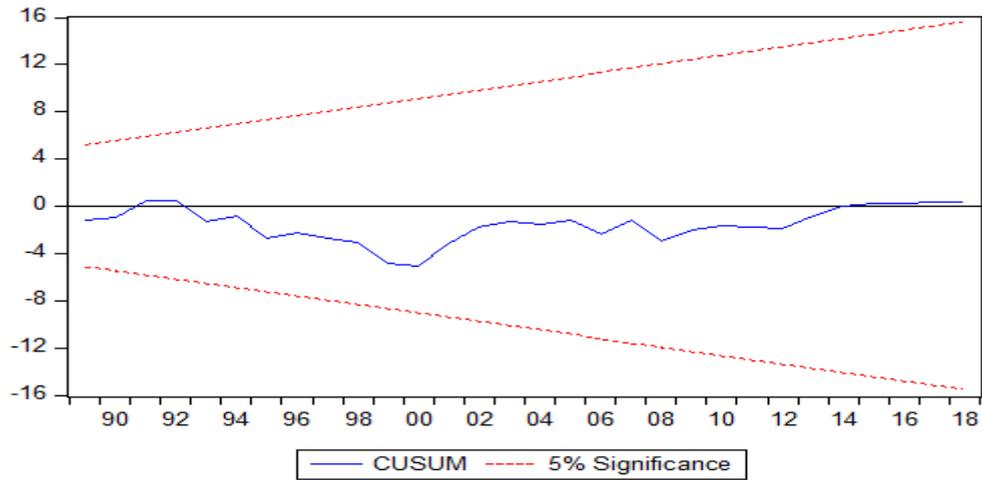
450 suggests that there is no evidence of serial correlation in the model. The Breusch-Pagan-

451 Godfrey test for heteroskedasticity 0.660(0.67), indicates that residual do not suffer from

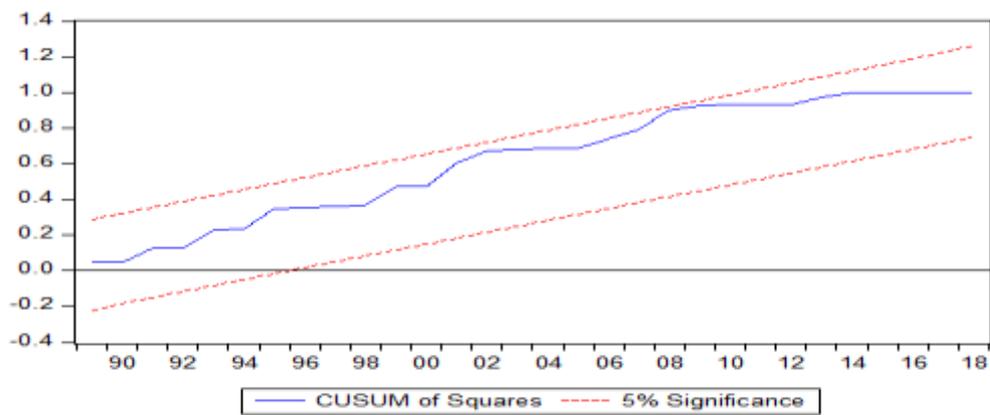
452 heteroskedasticity. Additionally, Figures 2 shows the CUSUM and CUSUM of squares tests

453 graphs validates the stability of each of the models.

454



455  
456



457

458 **6. Conclusion and Policy Recommendation**

459

460 The study analyzed the effect of extent of fiscal decentralization on the poverty reduction in  
 461 Nigeria using time series data from 1981 to 2018 and the auto-regressive distributed lag  
 462 (ARDL) bounds testing and estimation technique was employed. Most of the previous studies  
 463 examined the effect of different forms of fiscal decentralization within an economy on  
 464 development using various indicators and analytical techniques at mainly subnational level  
 465 only.

466 However, since fiscal decentralization is the distribution of responsibilities among different  
 467 levels of governance in the economy, one of the contributions of this study is the government  
 468 level comparison of the effect of central and state government fiscal responsibilities on  
 469 poverty reduction in the country. Results from the model consistently indicate that only the  
 470 state government expenditure has a positive effect on poverty reduction in the long-run.  
 471 Whereas, the central government expenditure was found to increase poverty level in Nigeria,  
 472 which is as a result of massive corruption in the central governance. The control variable

473 (foreign direct investment), was found to be consistently statistically negative irrespective of  
474 time, suggesting that FDI inflow in the country does not have the potential of reducing poverty  
475 rather it increases it over the short and long period due to its crowding out effect on some  
476 macroeconomic components of the economy and employment limiting technologies that is  
477 being used by foreign firms. Among others things, the results provide evidence that state  
478 governments' expenditures in the general government expenditure has positive effect on  
479 poverty reduction in the country.

480 In view of the importance of state government expenditure in enhancing poverty reduction,  
481 there is a need to strengthen state government revenue collection ability in order to meet  
482 development expenditure needs. In addition, there is a need for higher share of state  
483 governments revenue in the monthly revenue allocations in total government revenue so as to  
484 increase the level of state government expenditure and by implication reducing poverty level  
485 across the country.

#### 486 **Abbreviations**

487 UN: United Nation; HDI: Human Development Index; FCT: Federal Capital Territory; LGAs:  
488 Local Government Areas; GDP: Gross Domestic Product; DOLS: Dynamic Ordinary Least  
489 Square; FMOLS: Fully Modified Ordinary Least Square; GMM: Generalized Methods of  
490 Moments (GMM); FDI: Foreign Direct Investment; ECOWAS: Economic Community of  
491 West African States; OPEC: Organization of Petroleum Exporting Countries; VAR: Vector  
492 autoregression; FE: Federal Government Expenditure; SE: State Government Expenditure;  
493 ARDL: autoregressive distributed lag; ECM: error correction model; CBN: Central Bank of  
494 Nigeria; PP: Phillips–Perron; KPSS: Kwiatkowski–Phillips–Schmidt–Shin.

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507 The data for this present study are sourced from the database of the statistical bulletin of  
508 Nigeria CBN (<https://www.cbn.gov.ng/>) and World Development Indicators  
509 (<https://data.worldbank.org/>). Dataset analysed in this study is available from the  
510 corresponding author on reasonable request.

#### 512 **Competing interests**

513 The authors declare that they have no competing interests

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519

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# Figures

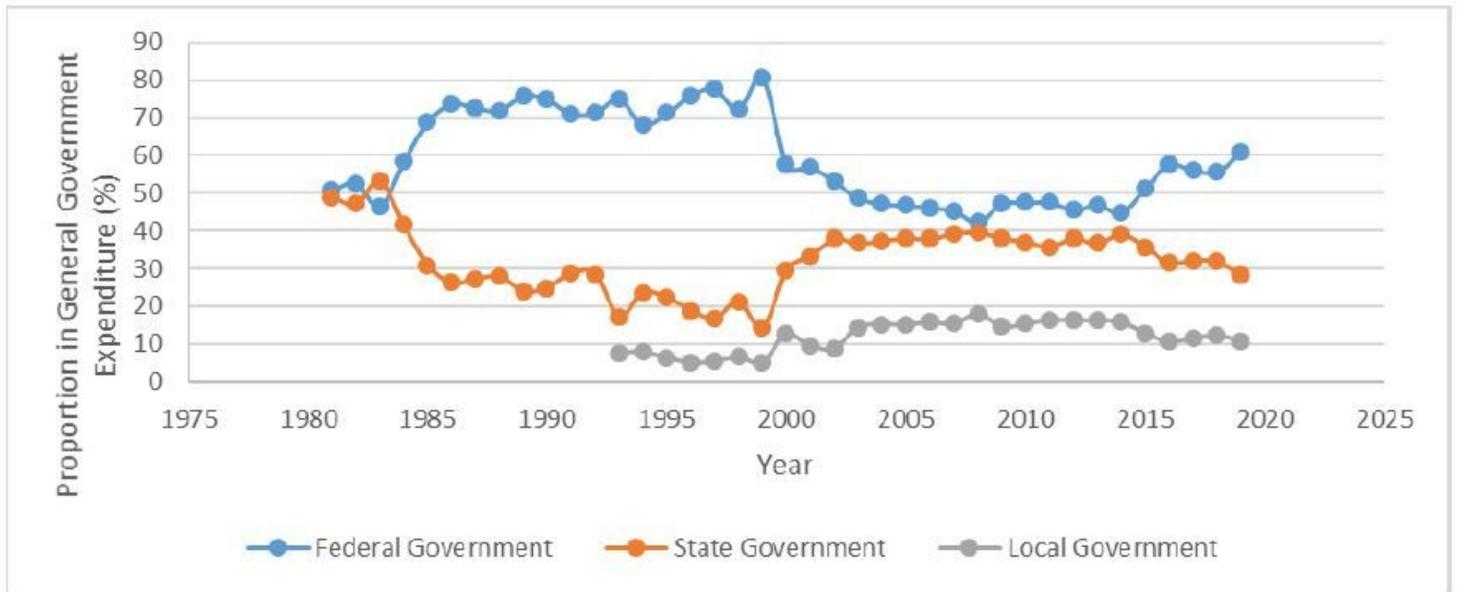


Figure 1

Trend in Federal (Central), State and Local Government Expenditure Source: Authors