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FISCAL FEDERALISM AND ECONOMIC DEVELOPMENT IN NIGERIA: AN ECONOMETRIC ANALYSIS

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Abstract:

This study examined the impact of fiscal federalism on economic development in Nigeria over the period 1981 to 2020 using annual time series. Both revenue and expenditure decentralization were used as measures of fiscal federalism. Analytically, the study employed the autoregressive distributed lag approach. The result reveals that in the long run, revenue and expenditure decentralization have a positive and significant impact on economic development in Nigeria, and many scholars have validated this finding. This finding shows that true fiscal federalism is better captured by both subnational revenue and expenditure decentralization. Given the finding, the study suggests that more fiscal power should be devolved to state and local governments in Nigeria through appropriate legislation.

Keywords:

Fiscal Federalism, Revenue Decentralization, Expenditure, Economic Development, ARDL Approach

JEL Classification: C10, H11, H71

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Introduction

Over the last several decades many developing countries, particularly in Sub-Saharan Africa (SSA) have made remarkable progress in devolving fiscal and political authority to subnational governments. According to Garman et al. (2001), over 80% of the seventy-five developing countries analyzed have been undergoing some devolvement of authority by the beginning of the millennium. Similarly, Hooghe et al. (2010) revealed 70% of the 42 democracies and semi-democracies countries examined have devolved fiscal and political authorities to subnational governments since 1950. In this situation, fiscal responsibilities are vested in both national and subnational governments- the federal, state, and local. This gives rise to fiscal federalism or fiscal decentralization.

Fiscal federalism is a term used synonymously with fiscal decentralization. Fiscal federalism is motivated by quite different reasons. Indeed, fiscal decentralization works as a source of creativity and innovation and thus as the engine of social and economic development (Blankart, 2007; Oates, 1993). This means that decentralization is key to the provision of public sector goods and services to the people which in turn creates opportunities for higher growth and welfare. Also, in order to contain ethnic conflicts, and separatist movements, and smooth out social and political tensions, decentralization is being sought by means of allowing more local autonomy. Many scholars have argued that the state and local governments are better placed to respond to their development aspirations and challenges because of their proximity to the citizenry (Wallace, 1999; Kumar, 2005; Bojanic, 2018). According to Sachs et al. (2021), OECD economic outlook reveals that the 17 underline Sustainable Development Goals can only be achieved with the proper coordination and engagement of the subnational governments. This recent resurgence of interest in fiscal federalism-economic development relations calls for empirical investigation. In this regard, Oates's (1972) theorem predicts a greater efficiency of decentralized service delivery, and public goods (Scharpf, 1988) in terms of allocative, and redistributive efficiency, which is using available resources to better match taxpayers' preferences and needs. This in turn leads to citizens' improved welfare. This means that fiscal federalism has a positive developmental outcome. The argument that fiscal federalism induces economic growth and development through the efficient allocation of resources has been the aim for more fiscally decentralized economies in recent times. Moreover, this has triggered much empirical investigation into the fiscal federalism-economic development relationship.

Similarly, fiscal federalism can be seen as a public sector that consists of both centralized and decentralized levels of decision-making in which choices made at each level concerning development are largely determined by the people of the perspective jurisdiction (Okwesili et al., n.a). According to Okoli (2004), fiscal federalism is a system of shared power between units of government. It is a system where within a nation two or more levels of government have formal authority over the same area and people. It is in view of the underlying imperatives of federalism that Anyanwu (1997) argued that fiscal federalism is the coexistence of both national and subnational governments which perform the economic functions required by the people of the society. On the other hand, Okigbo (1965) postulated that fiscal federalism is the existence in one country of more than one level of government, each with different expenditure responsibilities and taxing powers. Similarly, Ozor (2004) sees fiscal federalism as a system of government in which the allocation of taxing power, federally collectible revenue, and federal expenditure rest with the different levels of government so as to enable them to discharge their assigned functions and responsibilities to their citizens. Also, Okeke & Eme, (2013) see fiscal federalism as a political-economic arrangement whereby the public revenue of a federation is shared among the various levels of government- the federal, state, and local. Therefore, fiscal federalism is a system that mirrors the level of autonomy and responsibility accorded to the federal, state, and local

governments to generate and expend revenue for the purpose of producing appropriate public goods and services to improve the public welfare of society.

In Nigeria, fiscal federalism is principally characterized by the sharing of fiscal resources amongst the three tiers of government that make up the Federation- the federal, state, and local government, with the aim of ensuring economic development and national unity. Section 162 of the 1999 constitution of the federal republic of Nigeria clearly stated the revenue-sharing arrangement among the component units of the nation. However, Nigeria's experience with fiscal federalism started in 1954. Currently, the revenue-sharing arrangement among the three tiers of government in Nigeria is the federal government 52.68 percent, the states 26.72 percent, and the local governments, 20.60 percent with 13 percent of derivation revenue going to the oil-producing states. Despite Nigeria's experience of fiscal federalism, almost 70 percent of the rural sector lives in a vicious circle of poverty (Oyinlola, 1999). Also, there are many human development challenges such as low literacy rates and high infant mortality rates, low per capita income and living standards, poor primary healthcare delivery, and widespread poverty and corruption (Okerhe, 2018; Amire & Okufuwa, 2020), and a life expectancy of 55.2 years which is one of the lowest life expectancies in Sub-Saharan Africa (WHO, 2018). Notwithstanding, the question that remains to be answered is whether rapid economic development is fiscal decentralized-led. This calls for an empirical investigation.

A closer look at Figure 1 (panel 1, 3, and 4) shows that within the period under review, the internally generated revenue (IGR) of the federating units has been steadily on the rise. Despite the increased revenue by different levels of government, the GDP per capita growth remained unstable for the period under review (See panel B). This implies instability in the welfare condition of the people. This does not corroborate the argument that fiscal decentralization will bring development closer to the people (Martinez-Vazquez et al., 2015). This is in line with Barro's (1990) and Rodden's (2002) positions that fiscal decentralization is harmful to developing economies' growth and development. This non-correspondence between internally generated revenue and GDP per capita growth trend further stirs interest to investigate the fiscal federalism-economic development relationship in Nigeria.

Empirically, the works on the relationship between fiscal federalism on economic growth/development are vast and conflicting. Some of the studies (e.g. Akai & Sakata, 2002; Thornton, 2007; Blöchliger and Égert, 2013; Olarewaju, 2014; Amire & Okufuwa, 2020) found a positive relationship, some studies (e.g. Aigbokhan, 1999; Udah and Ndiyo, 2011; Lin and Liu, 2000; Thiessen, 2003; Rodriguez-Pose & Ezcurra, 2011) found negative relationship, and several other studies (e.g. Woller & Philip, 1998; Baskaran & Feld, 2013) found insignificant relationship. This has raised several questions in the minds of scholars and policymakers about the benefits of fiscal federalism in promoting economic development. It is worthy of note, that the existing literature on the fiscal federalism-economic development relationship which is based on different countries, fiscal federalism proxies, and varied econometric approaches failed to provide a conclusive result. Therefore, there is a need for increased empirical examination of the impact of fiscal federalism on economic development in Nigeria, since fiscal federalism has been a reoccurring issue.

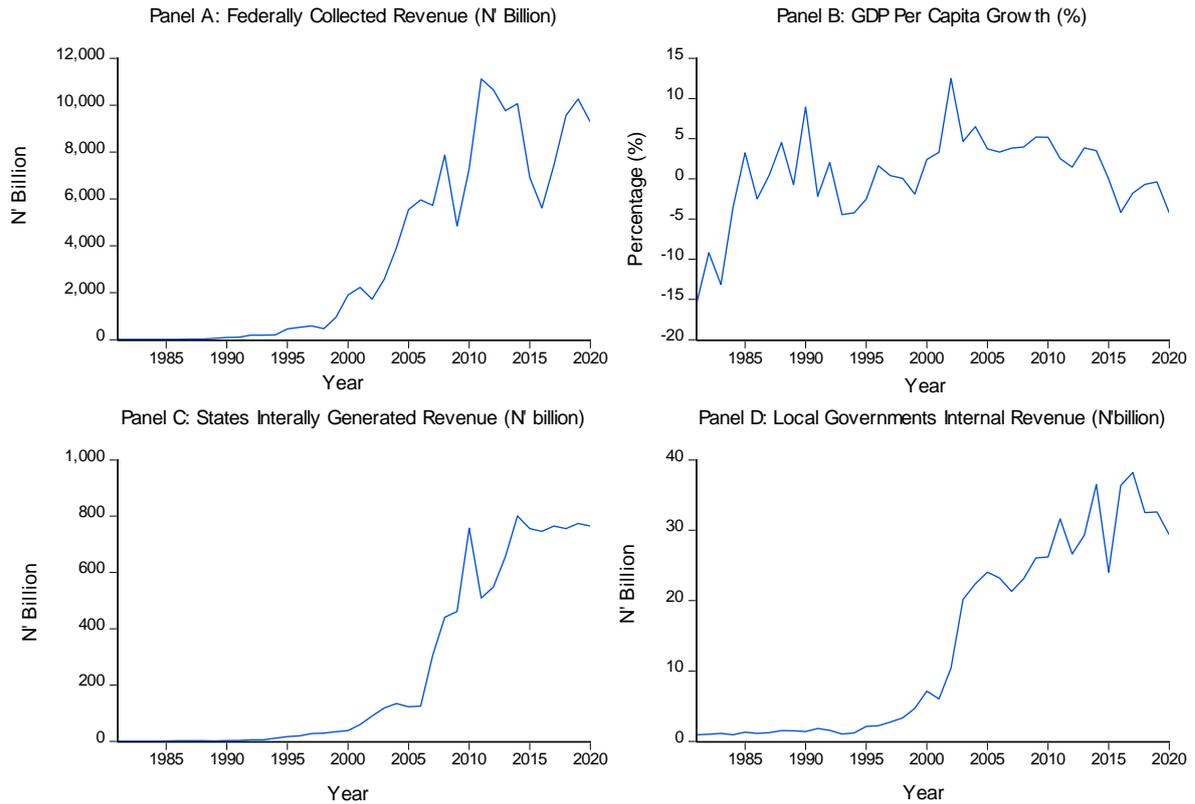


Figure 1: Nigeria's Fiscal Federalism Schematic, 1985-2020.

The rest of the paper is organized as follows. Following the introduction is the literature review which is in section two, and section three deals with the method of analysis. Section four focuses on the empirical results and analysis of the relationship between fiscal federalism and economic development in Nigeria while section five deals with the concluding remarks.

2. Literature Review

2.1. Assignment of Revenue/Taxing Powers in Nigeria

Table 1 shows all the major sources of revenue under the jurisdiction of different levels of government. Table 1 shows that in Nigeria the Federal government has superior revenue power over states and local governments (sub-national). That is, the Federal government enjoys a greater ability to raise revenue to meet its expenditure obligations than states and local governments do. The table shows that all major sources of revenue are centralized at the Federal level which is then transferred to the states and local governments through the Federation Account, and the Local Government Joint Account respectively. This may be the reason for the imbalances in the decentralization process between the Federal and sub-nationals. The sub-national units are heavily dependent on the Federal government. This has led to a lack of correspondence between the fiscal responsibilities assigned to the various levels of government and the revenue power assigned to them. According to Anyanwu (1997), this situation is being compounded by shifts in fiscal responsibilities from the Federal to other levels of government, especially the local governments.

Table 1: Nigeria's Major Taxes, Jurisdiction, and Right to Revenue

Types of Tax	Jurisdiction		Right to Revenue
	Law	Administration and Collection	
Import Duties	Federal	Federal	Federation Account
Excise Duties	Federal	Federal	Federation Account
Export Duties*	Federal	Federal	Federation Account
Mining Rents and Royalties	Federal	Federal	Federation Account
Petroleum Profit Tax	Federal	Federal	Federation Account
Company Income Tax	Federal	Federal	Federation Account
Capital Gain Tax	Federal	Federal/State	States
Personal Income Tax (Other than those listed in 9)	Federal	State	States
Personal Income Tax: Armed Forces, External Affairs Officers, Non-Residents, Residents of the Federal Capital Territory, and Nigerian Police Force	Federal	Federal	Federal
Licenses Fees on Television and Wireless Radio	Federal	Local	Local
Stamp Duties	Federal	Federal/State	States
Capital Transfer Tax	Federal	State	States
Value Added Tax	Federal	Federal/State	Federal/States/Local
Pools Betting and other Betting Taxes	State	State	States
Motor Vehicles and Drivers' Licences	State	State	States
Entertainment Tax	State	State	States
Land Registration and Fees	State	States	States/Local
Property Taxes and Rating	State	Local	Local
Market and Trading Licence and Fees.	State	Local	Local

*Listed but no longer imposed

Source: Anyanwu, 1997.

2.2. Theoretical Development

According to Martinez-Vazquez and McNab (1997), the "traditional or first-generation" theory of fiscal federalism has given little or no attention to fiscal federalism- economic growth relationship, both theory, and practice, however, in recent times normative discussions of fiscal federalism incorporated economic growth into the traditional list of public finance objectives of efficiency in the allocation of resources, horizontal fiscal imbalances, and economic stabilization. They argued that fiscal federalism may impact on economic growth, directly but the theoretical basis for this remains largely underdeveloped. The validity of the empirical study on the fiscal federalism-economic growth relationship has been undermined due to the lack of an adequate theoretical framework. However, some scholars (Oates, 1972; Boadway & Wildasin, 1984) were of the view that, the traditional theory for fiscal federalism argument is that it may provide greater economic efficiency in the allocation of resources in the public sector, and provision of local public goods,

and this allocative efficiency will, in turn, lead to economic development (Tiebout, 1956). In light of this, Oates (1972), Kalirajan and Otsuka (2012) argued that in fiscal federalism, resources are allocated in such a way that it will yield the optimum benefits, and the subnational competition will be conducive to technological progress. This implies that fiscal federalism has a positive effect on economic development. This is the view of the “traditional” or “first-generation” theory of fiscal federalism. This traditional theory postulates that the goal of public policymakers is to maximize societal welfare (Weingast, 2009). Contrarily, the “second-generation theory” of fiscal federalism postulates that the goal of public policy-makers is usually influenced by political instructions, thereby causing deviation from the welfare maximization objective of the society. In light of this, some scholars (Prud’homme, 1995; Weingast, 2009; Oates, 2005) argued that fiscal federalism could pose a significant risk to macroeconomic fundamentals when public decision goals undermine citizens’ welfare maximization due to the influence of political institutions.

2.3. Empirical Review

Empirically, there have been sizable studies on the relationship between fiscal federalism and economic growth/development. Perhaps, Davoodi and Zou (1998) were among the first to empirically investigate fiscal federalism-economic growth nexus. Using a panel of 46 countries for the time period 1970-1989, Davoodi and Zou (1998) found a negative link between Fiscal federalism and economic development in developing countries, and no association in developed economies. Also, Zhang and Zou (1998), Xie et al. (1999), Lin and Liu (2000), Thiessen (2003), and Rodriguez-Pose & Ezcurra (2011) found a negative significant relationship between fiscal federalism and economic growth for a single country like China, and for cross-country studies of OECD countries. Furthermore, Bodman & Ford (2006) investigated the relationship between fiscal decentralization and economic growth, using cross-sectional data for a group of 18 OECD countries, and their study revealed that there is no evidence of a direct relationship between FD and economic growth.

In country-specific studies, Feld et al. (2004) found that in Switzerland, greater subnational fiscal autonomy has led to faster economic growth. Similarly, Qiao et al. (2008) found a positive impact of fiscal federalism on growth in China. Akai and Sakata (2002) show that decentralization improves economic growth and business climate in the United States. Lin and Liu (2000) detected a positive impact of fiscal decentralization on the economic growth rate in China which is attributed to efficiency improvement in resource allocation rather than a higher investment drive. Also, Stansel (2005) found a significant positive relationship between decentralization and economic growth in the United State of America. Contrarily, Adefeso and Abioro (2016) found a significant negative relationship between decentralization and economic development in Nigeria.

In a cross-country analysis, Gemmill et al. (2013) found a positive relationship between the decentralization of tax revenues and economic growth, and Blöchliger & Égert (2013) found a positive relationship between fiscal federalism and GDP per capita, productivity or human capital for the time period 1970 and 2010 for OECD countries. Ismail and Hamzah (2006) found a positive relationship between expenditure decentralization, and economic growth, and a negative insignificant relationship between revenue decentralization and economic growth using a production function-based estimation framework and cross-section data for Indonesia. Similarly, Filippetti and Sacchi (2016) found a positive relationship using a sample of 21 OECD countries for the time period 1970-2010. Yilmaz (1999) found a significant positive relationship between fiscal decentralization and per capita growth for unitary countries. Olaide et al. (2022) investigated the relationship between fiscal federalism and sustainable development using a panel data set of 40 countries, which includes 11 federations and 29 non-federations for the time period 2006 to 2018, and found a non-significant relationship between fiscal federalism and aggregate sustainable development, environmental and natural resource development index, and social

development index, but found a significant positive impact of fiscal federalism on economic development index. In the case of China, Zhang & Zou (1998) estimated the relationship between fiscal federalism and economic growth using panel data for the time period 1980-1992 and found that fiscal federalism reduced economic growth while Feltenstein and Iwata (2005) used a VAR framework on time series for the period 1952 to 1996, and found that fiscal federalism increased economic growth.

Fiscal federalism can affect the real estate market by allocating public funds to infrastructure such as roads, schools, and parks that increase the value of surrounding properties, Hromada (2019, 2021). At the same time, regional and local tax policies that are based on fiscal federalism can affect property prices by including property taxes or tax credits. Finally, fiscal federalism can also affect real estate demand by encouraging population migration between regions with different levels of public services and taxes, Machova (2022). There has been a vast research on social and economic impact on the labour market, Jasova (2017), regional development and housing affordability changes, Cermakova (2022), environmental issues and overall long-run structural development of the region, Kaderabkova, (2011), Lukavec (2017).

Using a sample of developing countries, Woller and Philipps (1998) found a non-significant relationship between economic growth and decentralization. This result is in line with Limi (2005), Thornton (2007), and Baskaran & Feld (2013). Using panel data from developed and less developed countries for the periods 1990-2006, Rodriguez & Ezcurra (2011) found no relationship between decentralization and reduction of regional inequality in developed countries. Also, Olaide et al. (2022) found a non-significant relationship between fiscal federalism and aggregate sustainable development using a panel data set of 40 countries for the time period 2006-2018.

Empirical studies on the relationship between fiscal decentralization and economic growth in Nigeria are many. Ewetan *et al.* (2016) using time series data for the time period 1970 -2012 found that fiscal decentralization has a significant positive impact on economic growth. This is in line with Bijimi (2008). Philip & Isah (2012) using three different measures of decentralization found a non-significant relationship between revenue decentralization and economic growth, and a negative significant negative relationship between expenditure decentralization and economic growth. Similarly, Atan & Esu's (2021) finding corroborates Philip and Isah's (2012). Amire & Okufuwa, (2020) used a vector error correction model to examine the impact of fiscal federalism on Nigeria's economic development for the time period 1981 to 2017 and found that fiscal federalism impacted positively on economic development in Nigeria. This result corroborated with Olarewaju (2014) who found a significant positive relationship between fiscal decentralization and economic growth for the time period 1980 -2010. Also, Eme (2011) examined the effect of fiscal decentralization on social outcomes measured in terms of infant mortality rate and literacy rate in Nigeria using panel data of the 36 states and the federal capital territory for the time period of 2002 to 2009 and found that fiscal decentralization lowers mortality rate, and brings about higher literacy rate. On the contrary, Aigbokhan (1999), Udah & Ndiyo (2011), and Udoh, Afangideh & Udeaja (2015), found a significant negative relationship between fiscal decentralization and economic growth in Nigeria. Using multiple regression analysis, Adefeso & Abioro (2016) found a significant negative relationship between decentralization and economic development in Nigeria.

Okonkwo & Godslove (2015) found a positive impact of revenue and expenditure decentralization on macroeconomic and economic stability while the fiscal dependence ratio impacted negatively on macroeconomic performance and economic stability. Ewetan *et al.* (2020) examined the relationship between fiscal federalism and economic development using the auto-regressive distributed lag approach for the time period, and they revealed that revenue decentralization has

a negatively non-significant impact on economic development while expenditure decentralization has a positively non-significant impact on economic development.

The empirical literature on the relationship between fiscal federalism and economic growth/development is mixed and contradictory. This is mostly because of the use of different data sets, methodologies, and fiscal federalism measurement issues. However, this study is to shed some on the relationship between fiscal federalism and economic development. In this regard, this study chooses to provide an answer to the following research question: what is the impact of fiscal federalism on economic development in Nigeria? This question begs for an empirical investigation.

3. Method of Analysis

3.1 Analytical Framework

Since there is no clear theoretical framework to guide empirical work on the relationship between fiscal federalism and economic growth/development many scholars employed the neoclassical growth model to justify the inclusion of fiscal federalism in growth regression. Therefore, this study follows Bodman & Ford (2006) and Atan & Esu (2021) to adopt the augmented neoclassical growth model but with little modifications. In the Bodman and Ford (2006), all the variables were expressed in their growth rates and, their study is on cross-country analysis while in this present study the variables are not expressed in their growth rates and, the study is on country-specific analysis. Also, this present study differs from Bodman and Ford (2006) in terms of fiscal federalism measures. They captured fiscal federalism using federalism dummy, the number of subnational government units, the number of elected subnational tiers of government and, the subnational to central government employee ratio while this study captured fiscal federalism using the ratio of total local and state governments' revenue and, the ratio of local and state governments' expenditure. Furthermore, Bodman and Ford (2006) used the government consumption to GDP ratio and the GDP deflator as a control variables while this present study adopted inflation, and trade openness to capture domestic and foreign sector influence.

In the augmented neoclassical growth model, total output depends on physical and human capital, labour, and total factor productivity (TFP). TFP in turn depends on a set of vectors, among them is fiscal federalism. The estimation uses a Cobb-Douglas-type production function. Analytically, this study examined the relationship between fiscal federalism and economic development (output per capita) using time series data and Autoregressive Distributed Lag (ARDL) framework.

The following specification of Cobb- Douglas production function is used;

$$Y = AK^{\beta_1}L^{\beta_2}$$

1

Where Y is the per capita income; L is labour; K is capital – which is divided into human and physical capital, and A is the total factor productivity (TFP) or efficiency parameter. TFP depends on a set of vectors, among them is fiscal federalism. This is important since the literature suggests that fiscal federalism is likely to affect growth through its impact on efficiency. Equation 1 can be expressed as a linear function by taking the log of both sides thus:

$$\ln RGDP C_i = \ln A_i + \beta_1 \ln K_i + \beta_2 \ln L_i \quad 2$$

Where RGDP is real GDP per capita. The efficiency growth (A) is assumed to be determined by an exogenous component, fiscal federalism (FF), inflation (IFL), and trade openness (TO). The framework for the relationship between efficiency growth and fiscal federalism is;

$$\ln A_i = \ln FF_i + \ln IFL_i + \ln TO_i \quad 3$$

Where inflation and trade openness are vector control variables. Inflation (LnIFL) is expected to control for macroeconomic stability in the model while trade openness (LnTO) is expected to control for external exposure. These vector control variables have been found to have a significant impact on economic growth/development, in most economic growth studies (Udah & Ndiyo, 2011; Onwioduokit & Esu, 2018).

Substituting equation 3 into Equation 2 expressed the composite function thus:

$$\ln RGDP_i = \ln FF_i + \ln IFL_i + \ln TO_i + \beta_1 \ln K_i + \beta_2 \ln L_i \quad 4$$

To be able to estimate equation (4), the econometric form of the equation is restated thus:

$$\ln RGDP_i = \beta_0 + \beta_1 \ln K_i + \beta_2 \ln L_i + \beta_3 \ln FF_i + \beta_4 \ln IFL_i + \beta_5 \ln TO_i + \varepsilon_i \quad 5$$

Where β_0 is the constant parameter, ε_i is the stochastic error term, and other variables are already defined. The β_s are elasticities of per capita income with respect to exogenous variables in the model. The apriori expectations of the variables are positive, except in the case of inflation which is indeterminate (Atan & Esu, 2021).

$$\varepsilon_{it} \sim IN(0, \sigma_{it}^2) \quad 6$$

The stochastic error term ε_{it} is assumed to be independently and normally distributed.

Analytically, the ARDL approach is adopted over other approaches, such as Johansen & Juselius (1990) because it is relatively more appropriate and efficient for a small sample size (< 100). Secondly, irrespective of whether the underlying variables are I(0) or I(1), or a combination of both, the ARDL approach can still be applied. Also, endogeneity is less of a problem, since each of the underlying variables stands as a single equation (Nkoro & Uko, 2016).

The ARDL Error Correction Model is specified thus;

$$\Delta \ln GDPC_i = \mu + \sum_{i=1}^{n-1} \beta_i \Delta \ln Z_{t-1} - \pi \hat{e}_{t-1} - \varepsilon_t \quad 7$$

Where π is the error correction coefficient or error correction mechanism. In fact, π tells us how much of the adjustment to equilibrium takes place in each period, or the magnitude of the equilibrium error corrected, so as to restore $\Delta \ln GDPC_i$ to equilibrium. $\Delta \ln Z_{t-1}$ denotes the $K \times 1$ vector of independent variables with fixed lags.

3.2. Data Sources

The data for this study were sourced from *macrotrends.net*, *worlddata.info*, *fred.stlouisfed.org*, and the *Central Bank of Nigeria Statistical Bulletin*. The data covered the period 1981 - 2020. The selection of the study time period of study was based on data availability.

3.3. Data Description

a. Dependent Variable

Economic Development: This is captured using Real GDP per capita (RGDPPC). This is the most common measure of welfare/development. However, there are other comprehensive measures of economic development as developed by the United Nations but due to the availability of data, this study adopted the real GDP per capita growth measure of economic development.

b. Independent Variables

Fiscal Federalism (FF): This study adopts two most used indicators of fiscal federalism: the Revenue decentralization measure and the Expenditure decentralization measure. These indices show the extent of fiscal federalism in a nation.

- Revenue Decentralization Measure (RDT): This is measured as the ratio of total local and state governments' revenue (i.e. sub-national governments' revenues) to consolidated government revenue (sum of local, state, and federal government revenue).

$$\text{Thus; } RDT = \frac{LGDR + SGDR}{LGDR + SGDR + FGDR}$$

8

Where LGDR is local government internally generated revenue, SGDR represents states internally generated revenue, and FGDR is total federally collected revenue.

- Expenditure Decentralization Measure (EDT): This is measured as the ratio of local and state governments' expenditure (i.e. sub-national governments' expenditures) to consolidated government revenue (sum of local, state, and federal government revenue).

$$\text{Thus; } EDT = \frac{LGDE + SGDE}{LGDE + SGDE + FGDE}$$

9

Where LGDE = local government expenditure, SGDE= state total expenditure, and FGDE = total federal government expenditure.

These indicators measure the extent of fiscal federalism or the size of resources controlled by both local and state governments.

These indicators of decentralization are used sequentially in the model to avoid multicollinearity.

To check the separate impact of the size of resources controlled by local and state government, revenue and expenditure decentralization can be defined as follows: Revenue decentralization is measured as the ratio of local/state government revenue to consolidated government revenue (sum of local, state, and federal government revenue) while expenditure decentralization is the ratio of local/state government expenditure to consolidated government revenue (sum of local, state, and federal government revenue).

These indicators measure the extent of fiscal federalism or the size of resources controlled by local and state governments.

Labour (L): This is measured by the number of persons engaged, and capital is divided into human and physical capital. **Capital (K)** – is divided into human and physical capital. Human capital (HK) is captured by primary school enrollment as a percentage of gross enrollment. Primary school enrolment is used due to the non-availability of data on secondary and tertiary school enrolment. *Physical capital (PK)* is captured using the gross capital formation to GDP ratio. The control variables are *trade openness (TO)* and *inflation (IFL)*. Trade openness is captured by the export-import GDP ratio. This measures the degree of national economy exposure to other economies of the world while inflation is measured by the consumer price index. The annual percentage change in the cost of consumer goods and services.

4. Results and Interpretation

4.1. Unit Root Test

The Augmented Dickey-Fuller (ADF) stationarity test results in Table 1 show that all variables are stationary at order I(1) except LnTO, and IFL which are stationary at order I(0). Hence, the long-run relationship among the variables was examined using ARDL bound cointegration test.

Table 1: Unit Root Test Result

Variables	Intercept	
	ADF Levels	ADF 1 st Diff
LRGDPC	-	-3.752976*
LnRDT	-	-6.714050*
LnEDT	-	-3.805258*
LnSGDR	-	-6.643404*
LnSGDE	-	-4.021807*
LnLGDR	-	-6.642002
LnLGDE	-	-4.026064*
LnL	-	-3.526485**
LnHK	-	-5.916840*
LnPK	-	-3.869537*
LnTO	-3.696819*	-
INF	-2.958773**	-

Note: *, ** denote 1%, and 5%, and the level of significance.

Source: Authors' Computation, 2022.

4.2. ARDL Cointegration Bounds Test

Having established that all the variables of the study are integrated of order one $I(1)$ except real GDP per capita, trade openness, and inflation, the bounds test procedure which is based on F-statistic is used to test for the existence of a cointegration relationship among the variables. Table 2 presents the results of the cointegration tests derived from equation 4. Since the sample size is small (<100 observations), the study employed the critical bounds values provided by Narayan (2005) as against the critical values provided by Pesaran et al. (2001). The results confirm the existence of a long-run relationship between the measures of fiscal federalism, and the underlying variables in models 1 and 2 (see Table 2). Models 1 and 2 capture the sub-national measures of fiscal federalism (i.e. sub-national government revenue and expenditure decentralization). Thus, the hypothesis of no long-run relationship between the underlying variables is rejected. With these outcomes, there is a need to analyze the short-run dynamic adjustment of the models under the error correction framework. However, the cointegration test results (F-Statistics) of models 3, 4, 5, and 6 are not reported in Table 2, all the same, the results confirm the existence of a long-run relationship among the variables. Models 3, 4, 5, and 6 capture the individual measures of fiscal federalism (i.e. local/state government revenue and expenditure decentralization). The F-Statistics of models 3, 4, 5, and 6 are 20.843, 17.495, 20.795, and 17.569 respectively. This F-Statistics is compared against the critical bounds values provided by Narayan (2005).

Table 2: ARDL Cointegration Bound Test

Model	F- Statistics	
Model 1: $RGDPC = f(LnRDT, LnL, LnHK, LnPK, LnTO, IFL)$	F- Stat = 20.399*	
Critical Value	Lower Bound	Upper Bound
1%	4.428	6.250

5%	3.202	4.544
10%	2.660	3.838
Model 2: $RGDP = f(LnEDT, LnL, LnHK, LnPK, LnTO, IFL)$ F- Stat = 9.529*		
Critical Value	Lower Bound	Upper Bound
1%	4.428	6.250
5%	3.202	4.544
10%	2.660	3.838

Notes: * denotes significance at 1% levels. Critical values are obtained from Narayan (2005).
 Source: Authors' Computation, 2022.

Also, the results of the cointegration tests confirm that there exists a long-run relationship between local/state government internal generated revenue as a measure of fiscal federalism and the underlying variables. Furthermore, the results reveal that there exists a long-run relationship between local/state government total expenditure as a measure of fiscal federalism and the underlying variables. These results are not presented here but can be made available on request. With these outcomes, there is a need to analyze the short-run dynamic adjustment of the above models under the error correction framework.

Table 3: Cointegration and Error Correction Estimates of the Impact of Fiscal Federalism on Economic Development

<i>Dependent Variables: Economic Development(Real GDP Per Capita (LRGDP))</i>						
<i>Regressors</i>	1	2	3	4	5	6
Long-Run Cointegration Estimates						
<i>Sub-national Govts Revenue Decentralization (LnRDT)</i>	0.661*					
<i>Sub-national Govts Expenditure Decentralization (LnEDT)</i>		0.271*				
<i>State Government Revenue Decentralization (LnSGDR)</i>			0.606*			
<i>State Government Expenditure Decentralization (LnSGDE)</i>				0.252*		
<i>Local Government Revenue Decentralization(LnLGDR)</i>					0.603*	
<i>Local Government Expenditure Decentralization(LnLGDE)</i>						0.251*
<i>Labour (LNL)</i>	0.171	1.243*	0.423	1.202*	0.431	1.198*
<i>Human capital (LnHK)</i>	0.775*	0.203	0.689*	0.172	0.682*	0.179
	*		*		*	
<i>Physical capital (LnPK)</i>	-	-	-	-	-	-
	0.661*	0.565*	0.682*	0.533*	0.679*	0.529*
<i>Trade Openness(LnTO)</i>	-0.078	0.119*	-	0.120*	-0.005	0.118*
		*	0.004			
<i>Inflation(IFL)</i>	-	-	-	-	-	-
	0.013*	0.001*	0.010*	0.001*	0.010*	0.001*
	*		*		*	
Short-Run ECM Estimates						
<i>ECM_{t-1}</i>	-	-	-	-	-	-
	0.253*	0.724*	0.282*	0.918*	0.287*	0.929*
Adj. R²	0.90	0.93	0.90	0.95	0.91	0.95
<i>Breusch-Godfrey Serial Correlation LM Test</i>	0.249	1.746	0.112	0.408	0.113	0.252
	(0.628	(0.235	(0.745	(0.537	(0.744	(0.627
))))))
<i>ARCH Test</i>	0.310	0.163	0.084	0.145	0.065	0.104
	(0.582	(0.689	(0.774	(0.706	(0.780	(0.749
))))))
<i>Ramsey RESET Test</i>	0.067	2.651	0.108	0.490	0.106	0.372

(0.801	(0.138	(0.749	(0.500	(0.751	(0.556
))))))

Note: Coefficients of the variables are derived from various regressions linking real output per capita to the various decentralization indicators and a set of control variables. Decentralization indicators are inserted sequentially into the equations in order to avoid multicollinearity. *, ** denote 1%, and 5% levels of significance. The values in the bracket () are probabilities significant level.

Source: Authors' Computation. 2022.

Table 3 shows the extent to which fiscal federalism promoted economic development in Nigeria in the short-run and long-run. Thus the discussion is on the measures of fiscal federalism such as revenue decentralization and expenditure decentralization as well as economic development.

The long-run economic development effects of fiscal federalism (decentralization) indicators, as shown in Table 3, appear to be positively significant. This implies that decentralization ratios are associated with a real GDP per capita increase. This result provides support for Oates (1972), Kalirajan & Otsuka (2012) that fiscal federalism has a positive effect on economic development.

The results in Table 3 (column1, 3, and 5) reveal that the sub-national governments and individual unit revenue decentralization have the expected positive sign and the same significant impact on economic development. This implies that a revenue share increase will bring about an increase in economic development. The same holds with respect to the sub-national governments, and individual unit expenditure decentralization in columns (2, 4, and 6).

The revenue and expenditure decentralization have a strong and positive significant impact on economic development in Nigeria. This finding suggests that true fiscal federalism is better captured by both sub-national revenue and expenditure decentralization. This reveals that an increase in fiscal autonomy will certainly contribute to efficiency in economic activities which in turn will bring about improved welfare. This could be said that the agitation for fiscal federalism (fiscal autonomy/resource control) is based on its economic developmental implication. The positive impact of revenue decentralization could be attributed to the fact that sub-national governments now adopt effective and efficient revenue generation strategies such as harmonization of the multiplicity of taxes on labour, businesses, and properties in order to block leakages to increase the internally generated revenue. This finding supports Olaide et al. (2006), Blochliger (2013), and Iimi (2005) but contradicts the findings of Aigbokhan (1999), Feld et al. (2004), Philip & Isah (2012), and Atan & Esu (2021). Also, the positive impact of expenditure decentralization could be attributed to sub-national governments now spending their resources to improve basic infrastructure and the efficiency of social services in order to boost economic activities which in turn will bring about improvement in the welfare of the people. This finding is in line with Olaide et al. (2022); Ewetan et al.(2020), Olaide et al.(2006), and Blochliger (2013) but contradicts the findings of Aigbokhan (1999), Feld et al. (2004), Philip & Isah (2012), and Atan et al.(2021).

The parameter estimates for labour show that the labour force has a significant positive impact on economic development, except in models 1, 3, and 5 with labour having a non-significant impact. This implies that an increased labour force is associated with a higher level of economic development. This also confirms that human capital investment is associated with a higher level of economic development. Furthermore, this shows that the educational system (Universal Basic Education or primary education) decentralized to the sub-national control is assumed to be effective. Human capital parameter estimates indicate a weak positive significant relationship with economic development except models 2, 4, and 6 (i.e. sub-national governments expenditure decentralization, state expenditure decentralization, and local decentralization respectively) with human capital having a non-significant impact. This implies that highly trained personnel is associated with high a level of economic development. This may be attributed to the level of

attention given to human capital development at the sub-national levels, though weak. On the other hand, physical capital estimates show a strong negative significant impact on economic development. This is contrary to theoretical expectations. This result could be attributed to public project abandonment as a result of project cost inflation, and misappropriation of funds meant for developmental projects. Another factor that may be responsible for the negative impact of physical capital is project distribution Lopsidedness. Rather than distributing public projects based on economic potentials, opportunities, and possibilities, projects are distributed on ethnic or political, or tribal sentiments. This could lead to undesirable economic development outcomes.

Inflation estimates reveal that inflation has a significant negative influence on economic development. These estimates are rightfully signed. This implies that inflation retards economic development. This means that inflation reduces the quality of life of the people through the high cost of living. According to Okun's law, an inflation rate that is above 3 percent is detrimental to the well-being of the people. This law agrees with Nigeria's situation. Trade openness estimates reveal a positive significant impact on economic development except models 1, 3, and 5 (i.e. sub-national, state, and local revenue decentralization) with trade openness having a negative non-significant impact on economic development. The implication of these results is that given the level of expenditure decentralization, trade openness will bring about improvement in the well-being of the people. Contrarily, given revenue decentralization, trade openness will bring about a fall in the well-being of the people.

From Table 3, the coefficients of the error correction mechanism (ECM) are negative and statistically significant at the 1 percent level. This validates the presence of long-run relationships among the series in the models. Also, this suggests that the system will adjust to equilibrium at a relatively low speed in models 1, 3, and 5 while the system will adjust to equilibrium at a relatively high speed per annum.

Overall, the results of the estimated models perform very well. Between 90 and 95 percent of the variation in real GDP per capita (economic development) can be attributed to the variables in the models. The post-estimation tests for the dynamic models are carried out to ascertain the fitness of the models. These tests include the linearity test (using the Ramsey Reset test), serial correlation test (using the LM test), and heteroskedasticity test (using the ARCH test). It is expected that the probability value of the F-statistic must not be significant at the level of 5 percent to conclude that the models are linear or correctly specified, there is no autocorrelation, and heteroskedasticity in the results. The null hypothesis is that the model is linear or correctly specified, there is no serial correlation, and heteroskedasticity respectively. The results from models in Table 3 show that the probability values for the three tests are greater than 5 percent, hence the models are said to be correctly specified, and there is no presence of autocorrelation as well as heteroskedasticity in the results of the models. Based on the model fitness statistics, the study concludes that the models' estimates are robust and reliable.

5. Concluding Remarks

This study investigated the impact of fiscal federalism on economic development in Nigeria over the period 1981 to 2020 using time series data. To capture fiscal federalism, the study adopts two most used indicators of fiscal federalism: revenue decentralization—the ratio of sub-national (sum of local and state) government revenue to total government revenue (sum of local, state, and federal governments revenue), and expenditure decentralization—ratio of subnational (sum of local and state) government expenditure to total government expenditure (sum of local, state, and federal governments revenue). To achieve the objective of the study, the autoregressive distributed lag (ARDL) method was used. Based on the analysis, the study found that in the long run, revenue and expenditure decentralization promote economic development in Nigeria, and many scholars have validated this finding. This finding shows that true fiscal federalism is better

captured by both subnational revenue and expenditure decentralization. Based on the finding, the study suggests that more fiscal power should be devolved to local and state governments in Nigeria through appropriate reforms and legislation. As the decentralization of fiscal powers to local and state government increases, the quality of public services will improve, this will in turn promote the well-being of the people in Nigeria. Also, there is a need to implement appropriate policies that will promote human and physical capital development, macroeconomic stability, as well as a favourable balance of trade as these will encourage economic development in the long-run in Nigeria.

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