**Fiscal Decentralization and Poverty in Selected African Countries: A case of per Capital Index**

**Abstract**

This investigated how fiscal decentralization influences poverty in selected African countries from the implication of fiscal decentralization on per capita income of the citizens of the selected African countries. The study adopted an ex post facto research design, and data were collected from World Bank Indicators (WDI), the International Monetary Fund (IMF) fiscal decentralization database, and the World Governance Index (WGI) of ten selected African countries for a period of 18 years from 2006 to 2023 fiscal years. The study employed descriptive statistics and inferential regression analysis. Considering using the panel unit root test (PURT) of Levin, Lin, and Chu (LLC, 2002) and Im, Persaran, and Shin (IPS, 2003), the Augmented Dickey-Fuller (ADF) and the Philips-Perron (PP)-based tests were also tested as first-generation PURT. The panel regression analysis revealed that fiscal decentralization determinants had a significant effect on per capita income as a measure of poverty. The findings demonstrated that effective fiscal decentralization practice has the ability to enhance per capita income rating in Africa. The study recommended that governments at all levels should carefully explore and maximize true fiscal decentralization practices to improve the per capita income of their citizens.

**Keywords**: Expenditure decentralization share, Institutional quality, Per capita income, Poverty, Revenue decentralization share, Real gross domestic product rates.

**1. Introduction**

The persistent struggle of millions worldwide to meet even their most basic needs underscores the monumental challenge of poverty. According to the World Bank, in 2018, 8.6% of the global population lived in severe poverty, surviving on less than $1.90 a day, and incidentally, as of 2022, the scourge of poverty has not abated due to the growing world population (World Bank, 2022). While this marks an improvement over previous decades, it, however, highlights the widespread nature of poverty in many regions. In South Asia and Sub-Saharan Africa, over 40% of the population lives in extreme poverty (World Bank, 2020), revealing significant regional disparities. Conversely, the Pacific and East Asia have made notable progress in alleviating poverty. In many regions, poverty remains deeply rooted in factors beyond mere income, such as access to clean water, sanitation, healthcare, and education, as captured by the United Nations Development Program's Multidimensional Poverty Index (MPI) (Alkire et al., 2021; Rani, 2021). Despite the global decline in poverty in recent years, it remains a pressing issue. Large populations continue to face poverty, with relative poverty becoming an increasing concern and progress towards poverty reduction varying widely across different regions (Nwambuko et al., 2023).

Economic growth, integration, and targeted anti-poverty initiatives have been key factors in reducing poverty. However, the emergence of the COVID-19 pandemic has undoubtedly caused a significant rise in extreme poverty, representing the most considerable setback in decades. In response, the United Nations implemented a comprehensive socio-economic framework and established the Secretary-General's UN COVID-19 Response and Recovery Fund in April 2020 (Aduma et al., 2023; Amoaning et al., 2023). In Africa, various studies have explored poverty reduction strategies. Matekenya et al. (2020) noted that Rwanda's success in poverty reduction is partly due to its emphasis on inclusive economic growth and social protection schemes. Sub-Saharan Africa has some of the highest poverty rates globally, particularly in rural areas where many rely on agriculture. According to UNICEF, about 58% of children in Sub-Saharan Africa live in poverty, with limited access to essential services like healthcare and education (Khobai et al., 2018; Kircher, 2020).

Poverty is a global concern. It is primarily linked to poor resource management, particularly in developing economies. Africa is home to 23 of the 28 poorest nations and has the highest rates of extreme poverty, with over 25% of the world's hungry and 5% of its population malnourished. The western region of Africa suffers the worst infant mortality rates globally, with one in eleven children dying before age five due to malnutrition and diseases like pneumonia and malaria (Amoaning et al., 2023; Aduma et al., 2023). Poverty in Africa is driven by factors like population growth, conflicts, poor trade agreements, disease, corruption, and inadequate economic policies (Hauwah et al., 2023; Masduki et al., 2022; Onah, 2023). The African Development Bank reported that 61.9% of Sub-Saharan Africa's population lives in multidimensional poverty, with Nigeria contributing a significant portion (African Development Bank, 2022). Poverty results in low agricultural output, restricted economic growth, social unrest, poor health, and food insecurity, perpetuating a cycle of poverty (Sima et al., 2023; Udeh et al., 2023).

Indeed, the profile of poverty in African countries exhibits similar structures. For instance, inGhana, the poverty rate in 2021 was 23.40% based on national poverty lines and 25.21% for those living on $2.15 a day (World Bank, 2022). The multidimensional poverty headcount ratio was 32.77% in 2016. Between 2012 and 2016, the annualized growth in per capita mean consumption or income was -0.20% for the bottom 40% and 1.27% overall. Ghana's population was 33.48 million in 2022, with a GDP growth rate of 3.1% and a GNI per capita of $2380 in 2022, up from $2280 in 2021 (Akeju & Ojogbede, 2022). In Liberia as well, 27.62% of the population lived on $2.15 a day in 2020, while 50.90% were below the national poverty line in 2016. The multidimensional poverty headcount ratio was 56.57% in 2016 (World Bank, 2022). Liberia's population was 5.30 million in 2022. The GNI per capita was $680 in 2022, up from $630 in 2021, and the GDP growth rate was 4.99% in 2021, slightly decreasing to 4.8% in 2022 (African Development Bank, 2022).

Among various policy options to alleviate the scourge of poverty in Africa, like in many other nations of the world, fiscal decentralization has been emphasized as a veritable tool for enhancing government's ability at all levels to tailor public services to mitigate poverty by addressing critical areas such as education, healthcare, and infrastructure according to the specific needs of their communities so as to create opportunities for local and regional governments to decentralize investments, leading to more efficient and effective service delivery (Anggraeni et al., 2020; Megbowon et al., 2021). Khobai et al. (2018) highlighted that fiscal decentralization encourages community involvement in decision-making, fostering a sense of ownership and responsibility among citizens in West Africa (Chakraborty & Sen, 2022; Sobczak et al., 2021). The World Bank (2022) reported that in Ghana, effective fiscal decentralization policies aim to make public services more responsive to local needs, increase transparency, and reduce corruption by making local governments more accountable, as seen in Accra's municipal and rural regions.

Studies have shown that fiscal decentralization is capable of influencing poverty by enhancing the extent of standard of living and improving per capita income of the citizens (Aguguom, 2019, Indeed, fiscal decentralization, which is the transfer of fiscal responsibilities and revenue-generating powers from central to sub-national governments, is crucial for public sector reform (Agyemang-Duah et al., 2018). This process aims to enhance governance, improve service delivery, and promote economic development by bringing government closer to the people. Khobai et al. (2018) remarked that experiences with fiscal decentralization vary significantly among countries in West Africa as a result of diverse political, economic, and social contexts. This study examines the fiscal decentralization efforts in Côte d’Ivoire, Ghana, Gambia, Mauritania, Senegal, and Nigeria, focusing on their objectives, implementation strategies, challenges, and outcomes. Fiscal decentralization in these countries brings significant benefits in governance and economic development by transferring financial control and decision-making power to local governments, enabling them to address local needs and priorities better, and enhancing accountability, transparency, and governance (Megbowon et al., 2021).

**2. Literature Review**

**Per capita Income**

Per capita income has been defined as an economic indicator and has been defined as a country's measurement of the total amount of money made per resident of a given country (Siti & Candra, 2020). According to Takeshima et al. (2021), per capita income is a form of economic metric employed to measure a person's income during a given time period within a predetermined set of monetary units, such as a city, province, country, geographic region, area, sector, and other diverse factors (Taruno, 2019; Tirtosuharto, 2022). Umoh and Ekpo (2023) opined that per capita income is used to assess the standard of living and overall quality of life of the populace as well as to calculate the average per-person income for a certain location. By dividing a country's national income by its population, one may get its per capita income. Every adult and kid, including newborns, is included in the population as defined by per capita income. This is in contrast to other commonly used indicators of an area's affluence, including household income, which considers as a household any individual living under one roof, and family income, which counts as a family any individual living under one roof who is connected to one another by birth, marriage, or adoption. The average income of a sector and the wealth of various populations are frequently compared using per capita income (Zhou & Yansui, 2022; Wang & Deng, 2023). Umaru and Chibuzo (2018) posited that poverty reduction and measures of per capita income are closely related, suggesting that the level of a country’s per capita income index reveals the extent of poverty prevalence in such a country. Per capita income is another commonly used metric to assess the standard of life in a nation, and when comparing the income levels of other nations, it is typically stated in a widely accepted international currency (Xia et al., 2022; Wang & Deng, 2023).

**2.2 Theoretical Review**

**Culture of Poverty Theory**

Additionally, it assumes that this subculture of poverty exists independently of external factors such as inequality, lack of access to education, or discriminatory policies (Nursini & Tawakkal, 2019). Supporters of this theory, such as Banfield & Wilson (2017), expanded on Lewis's ideas, suggesting that the poor lack the moral values required for success in a capitalist society. More recent scholars, such as Murray (2016) and Mead (2004), have reintroduced aspects of this theory, arguing that welfare systems in some countries may perpetuate a "dependency culture" where individuals lack the incentive to work or escape poverty. Howard (2021) and Gans (1995), although critical of some of its more deterministic elements, still use the theory to explore how poverty can be perpetuated by structural isolation and limited social capital. However, the theory has faced significant criticism, especially from scholars like Valentine (1968) and Sen (2000), who argue that the theory tends to "blame the victim" by focusing on the behavior of the poor rather than addressing the systemic and structural causes of poverty, such as inequality, discrimination, and lack of access to opportunities. Critics argue that poverty is more often the result of external factors like inadequate education systems, poor infrastructure, and biased economic policies than internal cultural attributes. Despite these criticisms, the Culture of Poverty Theory remains relevant in discussions about fiscal decentralization and poverty reduction. In contexts where fiscal decentralization allows local governments more control over poverty-alleviation programs, understanding the local culture of poverty can be critical. If decentralization policies are to be effective, they must consider local beliefs, attitudes, and behavior that may hinder the poor from fully engaging in economic activities. This theory suggests that any effort toward poverty reduction needs to address not only the economic aspects but also the social and cultural dimensions of poverty.

**The Public Goods Theory**

The Public Goods Theory, primarily formulated by Paul Samuelson in his 1954 seminal paper, The Pure Theory of Public Expenditure, examines the provision of public goods and their role in promoting social welfare (Takeshima et al., 2023). Public goods are characterized by their non-excludability and non-rivalry; that is, one individual's consumption of the good does not reduce its availability to others, and no one can be effectively excluded from using it. This theory is crucial for understanding the role of government in funding and providing services that benefit the public, particularly in alleviating poverty. The main argument of public goods theory is that certain goods and services, such as education, healthcare, and infrastructure, are best provided by the government rather than through private markets. Samuelson argued that because individuals may not be willing to pay for public goods voluntarily (due to the free-rider problem), government intervention is necessary to ensure their provision and funding through taxation (Akeju & Ojogbede, 2022; Udeh et al., 2023). Public goods can help reduce poverty by enhancing the overall welfare of society, providing benefits that are accessible to everyone, particularly the disadvantaged. This condition states that the sum of the marginal benefits that individuals receive from the public good should equal the marginal cost of providing it. This equation illustrates how local governments can assess the optimal level of public goods provision to maximize societal welfare, particularly in regions facing poverty (Obodai et al., 2022). In decentralized systems, local authorities can leverage this framework to allocate resources efficiently toward public goods that effectively combat poverty, ensuring that the benefits are shared across the community.

**Empirical Review**

Monkam and Mangwana (2024) explored how digital technologies can promote fiscal decentralization and revenue enhancement in Africa. Through a systematic literature review, they highlighted the importance of investing in digital infrastructure, skill development, and regulatory frameworks while addressing data privacy and security concerns. The significant effect found in this study is consistent with the findings found in some previous studies that have documented significant effects (Oladele et al., 2021; Hussen et al., 2021). However, on the contrary, some other studies have found insignificant effects, which are inconsistent with the results found in this study (Cheng et al., 2020; Adediran et al., 2024; Fashanu & Olowe, 2022).

In the investigation of the prevalence of poverty in Nigeria, Alozie (2024) uncovers some horrifying manifestations of the country's quest for sustained growth and unity. High rates of unemployment, inadequate food and nutrition, and high rates of infant and mother mortality are some of the symptoms. This presents the risk of undermining future harmony, which would strengthen disintegrative tendencies, including brain drain, coup d'état, conflict shocks, and child labor. Every area of society, but especially faith-based organizations (FBOs), must come up with creative new collaborations and programs in Nigerian communities in light of the government's failure to reduce poverty there. Therefore, eradicating poverty in Nigeria has become a moral obligation for all people. The goal of Udeagha and Breitenbach (2023) is to shed light on the possible functions of this relationship in South Africa between 1960 and 2020. Unlike previous studies, this one employs a unique dynamic autoregressive distributed lag simulation approach to evaluate the effects of trade openness, energy consumption, industrial growth, fiscal decentralization, scale effect, technique effect, and technological innovation on CO₂ emissions, both positively and negatively. Nonetheless, its square (as indicated by the method impact) supported the environmental Kuznets curve theory and strengthened ecological preservation. While technological innovation promoted ecological integrity, energy use, trade openness, industrial value-added, and foreign direct investment were the main drivers of CO2 emissions. The results indicate that in order to preserve South Africa's ecological sustainability, further fiscal decentralization should be implemented through the transfer of authority to local bodies, especially with regard to environmental policy matters. The study result is consistent with some other prior studies that have found a similar insignificant effect (Metasari et al., 2023; Siburian, 2022). On the contrary, some other studies have equally found significant effects, which is not in tandem with the result obtained in this study (Hussain et al., 2021; Ochonogor, 2020).

The impact of regional spending-based fiscal decentralization on poverty alleviation was studied by Masduki et al. in 2022. Throughout the years 2010–2018, the study employed a Partial Least Squares Structural Equation Model (PLS-SEM) to come to the conclusion that high-quality government spending can lower poverty and raise HDI in all undeveloped areas of Java Island, Indonesia. To evaluate their combined effect on poverty, two studies in particular incorporate interaction variables between social public spending and governance. The significant effect found in this study is consistent with the findings found in some previous studies that have documented significant effects (Ying et al., 2024; Syahrir, 2024). However, on the contrary, some other studies have found an insignificant effect, which is inconsistent with the result found in this study (Adediran et al., 2024; Fashanu & Olowe, 2022). Similarly, Mimoun & Raies (2022) examined the extent and the driving factors that could determine how political freedom and governance affect the relationship between public spending and poverty reduction. The study employed a panel of developing nations from secondary sources on the financial implications of government expenditure from 1980 to 2019. The study explored feasible generalized least squares (FGLS), and GMM was used to estimate their model in estimating the specified data. Their findings demonstrated that there was a stronger relationship between poverty and public spending on health and education under more democratic political regimes with higher levels of governance. The significant effect found in this study is consistent with the findings found in some previous studies that have documented significant effects (Mwiathi et al., 2018; Taruno, 2019; Ying et al., 2024). However, on the contrary, some other studies have found insignificant effects, which is inconsistent with the result found in this study (Adediran et al., 2024; Fashanu & Olowe, 2022).

Furthermore, Komarudin (2022) investigated fiscal decentralization in revenue generation and public spending aimed at providing essential amenities to enhance poverty reduction. The study carried out a time series regression analysis for the years 2003–2016; rising public health spending is associated with a larger decline in poverty in nations with better levels of governance throughout 24 developing nations, utilizing 2SLS and first-difference GMM. The result demonstrated that poverty reduction was significantly affected by government spending and decentralization of its fiscal policies. The significant effect found in this study is consistent with the findings found in some previous studies that have documented significant effects (Obayagbona, 2018; Nyaaba et al., 2018; Ying et al., 2024). However, on the contrary, some other studies have found insignificant effects, which are inconsistent with the results found in this study (Hadi & Nugroho, 2018; Adediran et al., 2024; Fashanu & Olowe, 2022).

In another development, the study conducted by Xia et al. (2022) investigated the effects of China's fiscal decentralization reform on carbon dioxide emissions between 2010 and 2019. In order to investigate the relationship between fiscal decentralization and carbon dioxide emissions under fiscal imbalance and transfer indirect effects, we employed a first-order differential dynamic panel econometrics model. The results showed that 1) spending asymmetry hindered CO₂ emissions management, and fiscal imbalance decreased CO₂ emissions as a result of revenue decentralization. 2) The negative effects of a fiscal imbalance are counteracted by the transfer payments made by the central government. There was a disparity between local revenue and budgetary expenditures as a result of the government's fiscal decentralization. However, it might have an impact on the amount local governments spend on reducing carbon emissions through central transfer payments, which might limit carbon emissions and manage environmental The study result is consistent with some other prior studies that have found similar insignificant effects (Cammeraat, 2020; Rani, 2021; Hung et al., 2022). On the contrary, some other studies have equally found significant effects that are not in tandem with the result obtained in this study (Hussain et al., 2021; Ngong et al., 2021).

Bello (2022) examined the impact of the Bank of Industry's MSME lending on poverty reduction in North-Central Nigeria. The study employed a descriptive statistical research methodology, focusing on MSME owners in the north-central states of Kwara and Kogi, as well as Bank of Industry employees in these states. The sample size was a percentage of all MSMEs in the two states, resulting in 52 respondents from Kogi State and 70 from Kwara State. Due to attrition, the final sample included 130 of the 122 participants. Bello found that MSME financing by the Bank of Industry significantly reduced poverty in the region. Consequently, the study recommends that federal, state, and local governments should provide more capital funding through the Bank of Industry to support MSMEs and reduce poverty, especially in north-central Nigeria. Bello's findings align with Umoh and Ekpo (2023), who concluded that entrepreneurship significantly impacts poverty reduction. However, Hussain et al. (2021) found that poverty in Nigeria has increased despite government poverty alleviation programs. In the same manner, Obi and Ugulu (2022) analyzed the relationship between unemployment and economic growth in Nigeria using time series data from 1981 to 2018 from the World Bank Development Indicators and the Central Bank of Nigeria. The autoregressive distributed lag model revealed that Nigeria has not fully harnessed its human resources, resulting in high unemployment exacerbated by COVID-19. The study recommended creating an enabling environment for business and foreign investment to reduce unemployment and achieve sustainable economic growth. These findings align with Metasari et al. (2023), who found that MSME development positively affects employment creation. However, on the contrary, the study by Oladele et al. (2021) found that bank credit to SMEs and personal savings do not impact unemployment.

**3. Methodology**

This study examined the effect of fiscal decentralization on poverty, surrogated with per capita income, in selected African countries: Cabo Verde, Kenya, Mauritius, Namibia, Nigeria, Rwanda, Senegal, South Africa, Tunisia, and Uganda. The poverty is the dependent variable of the study but is surrogated using per capita income, while fiscal decentralization is the independent variable using four proxies of revenue decentralization, expenditure decentralization, annual percentage growth of real GDP, and institutional quality.

**Theoretical Framework**

The theoretical framework of this study hangs on government budgets of the selected and sampled African countries.

The state is given a budget, , by the federal government to use on development expenditures and the public good in each LGA:

 (3.1)

 (3.2)

The federal government collects tax revenue from the wage income and distributes it to the state as well as providing the federal transfers:

 (3.3)

Where:

 (3.4)

We assume a simple alternating offer bargaining game, as in Marsiliani and Renström (2007). For instance, the federal government, with two elected representatives (type and ). Also, if one LGA is larger than another, we assume the Larger LGA (LGA 1) makes the first offer. LGA 2 can accept or reject. If LGA 2 rejects, then one representative is picked at random to make the final offer (the game could be extended to several rounds without altering the qualitative properties). In the last round if LGA *i* is picked to make the final offer, it will maximise its own utility subject to (3.9), implying setting *Dj*=*Gj*=0. Maximising (3.8) subject to (3.9) gives the optimal level of development expenditure and of the public good when all the budget is used in LGA *i*, and the resulting indirect utility:

 (3.5)

 (3.6)

 (3.7)

Where:

 (3.8)

If LGA 2 is not chosen in the last round, then since  it follows . If LGA 2 is chosen in the last round, utility is given by (3.15). Denote the probability that LGA 1 is chosen with *p*, then expected utility of LGA 2 to enter the last round is:

 (3.9)

Thus, LGA 2 accepts any proposal that satisfies the condition:

 (3.10)

When LGA 1 makes the first offer it maximises own utility subject to (3.8) and subject to (3.1), which can be rewritten as:

 (3.11)

Subject to: (3.12)

The first-order conditions imply that (3.12), (3.13), and (3.14) hold for the respective LGA evaluated at *R* and *R* respectively. *R* is chosen at the level where (3.20) holds with equality. That is:



 (3.13)

 (3.14)

 (3.15)

For  and

 (3.16)

Equations (3.21) -(3,34) completely characterize the bargaining equilibrium as a function of the Federal budget, *R*, and the federal tax rate, τ, and the benefit rate, θ. The same equations are obtained at the state level, using the ~ notation.

We shall characterize the situation when one LGA within one of the states dominates at the federal level. That is the situation where the finance minister comes from one of the states. The finance minister decides the allocation to the provinces, *R* and , taking into account the bargaining game at the federal and state level, so as to maximize own utility. At first, it could look as if the finance minister would set *R* for the other state to zero. This is not the case, as then production would stop, and no taxes could be collected from that state. Instead, it is optimal to maximize net tax revenue from the other states. Suppose the finance minister comes from state A, then is chosen to:

 (3.17)

Subject to (3.7)., (3.12), (3.21), (3.34)

The First Order Condition (FOC) to equation (3.35) give as a function of τ, θ, *w*, etc.

 (3.18)

Differentiating (3.36), and evaluating in a symmetric equilibrium (where the two LGA within a state are equal), we obtain:

 (3.19)

Recall: , then

 (3.20)

**Proposition:** *In the bargaining equilibrium the ratio of local expenditure to total expenditure is increasing in the federal transfer rate.* This proposition implies that if the federal transfer rate, b, is larger, then the decentralization measure is greater. Since a larger federal transfer rate alleviates poverty, we would expect poverty and fiscal decentralization to be negatively related.

In addition to the foregoing framework, it can be adduced from the standpoint of aggregate income model and the social contract, through taxation and redistribution theory that when household consumption propensities are reduced through taxation as a fiscal framework, the level of household welfares through disposable incomes are reduced and poverty is increased. It therefore takes a fiscally responsible government to balance the welfare loss of the citizens that triggers poverty with appropriate level of expenditure decentralization to positively trigger improved welfare (consumption propensities). This variant of theoretical framework is shown algebraically through Keynesian 3-sector closed economy aggregate income model as:

(3.21)

Equation (3.39) behaviourally shows that aggregate income in an economy is an additive function of consumption expenditure of the household sector (C), the private sector investment (I) that is essentially generated from the firms, and government expenditure (G). The government sector engages in fiscal activities as well through expenditure and revenue decentralization. While the households’ consumption is expressed in both autonomous and income-induced consumption, the investment of the firms (I) and government expenditure (G) are strictly autonomous in nature as shown in equation (3.21).

(3.22)

From equation (3.22), a & b respectively denote autonomous consumption and marginal propensity to consume (MPC) by households, while Yd is the disposable income of the household. Yd is obtained after deducting taxes imposed by the government on every taxable adult household (Revenue decentralization). Where T is the imposed tax being net out from the income of the households. With the implication of tax fiscal rule, equation (3.40) is expressed as:

(3.23a)

(3.24)

(3.25)

(3.26)

(3.27)

(3.28)

By differentiating equation (3.28) with respect to T and G shows that taxation reduce MPC (b) directly and inversely related to marginal propensity to save-MPS (1-b).

(3.29)

The implication of equation (3.29) is that with only revenue decentralization through income tax only rather increases poverty as consumption propensities of households reduces. When revenue decentralization is appropriately matched with expenditure decentralization, poverty will reduce as MPC of the households increases as a multiplier effect. This is shown in equation (3.29) as:

(3.30)

The multiplier effect of investment (I) is the same as that of government expenditure. Lastly, prudent management of fiscal decentralization, especially through expenditure decentralization is expected to counteract the welfare reducing or poverty generating effect of revenue decentralization through taxation on the part of the households. Thus, addition of equation (3.29) and (3.30) gives the desired fiscal balance as shown in equation (3.31).

(3.32)

The implication of equation (3.32) is that a fiscally prudent government would be able to use the tool of fiscal decentralization to reduce poverty especially through expenditure decentralization because expenditures on welfare enhancing projects and social amenities will balances the poverty inducing effects of revenue decentralization through taxation on income of households.

**Model Specifications**

Like the model one, the study by Adefeso and Abioro (2016) is followed to formulate the second model which premised on fiscal decentralization and per capita income in West African countries. The model is specified below.

 (3.1)

In an econometric form, the model is specified in linear form below:

 (3.2)

Where:

PCI = Per Capita Income, EXDS = Expenditure Decentralization Share, REVS = Revenue Decentralization Share, RGDPGR = Annual Growth Rate of Real GDP, IQI = Institutional Quality, α0, is the intercepts, and α1 – α4, are the coefficients.

**Trend Analysis**

**Trends of Per Capita Income and Fiscal Decentralization in African Countries**

The trends of the variables in Figure 2 are the same with that of Figure 1 with the exception of per capita income growth rate (PCIGR). It can be seen from the Figure that Cabo Verde has the highest average level of growth rate in per capita income PCI (9.34%) among the selected countries. Rwanda followed with 6.86%, Mauritius (5.78%), and Kenya with 3.60% while Nigeria is the least with a negative growth rate in PCI (-6.59%). It is worth noting that the case of South Africa and Nigeria is pathetic because these two countries had the highest level of expenditure decentralization, yet, the growth rate of PCI, an indicator of households’ welfare is worst in these countries at 0.72% and -6.59% respectively.

**Average Trend of per capital Income Growth & Fiscal Decentralization**

Figure 1: Trends of Per Capita Income and Fiscal Decentralization in selected African Countries, 2021-2023

**The Panel Cross-Sectional Dependence Test of the Variables**

This section presents the cross-sectional dependence test of the dependent and independent variaboe of the study.

**Table 1 Cross-Sectional Dependence Test for Variables**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| H0: There is no cross-sectional dependence | | | | | |
| Variables | **Breusch-Pagan LM** | **Pesaran scaled LM** | **Bias-corrected scaled LM** | **Pesaran CD** | **Remark** |
| EXDS | 175.864\*\*\*  (0.000) | 13.794  (0.000) | 13.500\*\*\*  (0.000) | -0.972  (0.331) | H0 rejected by the first three tests, but accepted by Pesaran CD |
| REVDS | 82.436\*\*\*  (0.000) | 3.946\*\*\*  (0.000) | 3.652\*\*\*  (0.000) | -1.969\*\*  (0.049) | H0 rejected |
| HDI | 624.439\*\*\*  (0.000) | 61.078\*\*\*  (0.000) | 60.784\*\*\*  (0.000) | 24.881\*\*\*  (0.000) | H0 rejected |
| RGDPGR | 257.730\*\*\*  (0.000) | 22.424\*\*\*  (0.000) | 22.129\*\*\*  (0.000) | 13.782\*\*\*  (0.000) | H0 rejected |
| IQI | 260.979\*\*\*  (0.000) | 22.766\*\*\*  (0.000) | 22.472\*\*\*  (0.000) | -1.607  (0.108) | H0 rejected by the first three tests, but accepted by Pesaran CD |

**Note: \*\* and \*\*\* denote that the variables are significant at 5% and 1% level of statistical significance**

**Source: Author’s computation through Eviews10 package**

In Table 1, in furtherance of the PURTs for the variables where it is found that the variables exhibit mix order of integration, it is imperative to test for the cross-sectional dependence of the series across the sampled countries in Africa. In this case, four tests were performed: The Breusch-Pagan Lagrange Multiplier (LM), the Pesaran Scaled Lagrange Multiplier (LM), the Bias-corrected scaled Lagrange Multiplier (LM), and the Pesaran Cross-sectional Dependence (CD). The result in Table 1, shows that the null hypothesis of no cross‐sectional dependence is rejected for all the variable, except EXDS and IQI where the Pesaran CD test upholds the null hypothesis. Based on the evidence from the other tests, there is a presence of cross-sectional dependence among the variables for the sampled countries. This shows that there are certain levels of dependences among the sampled countries. This further affirms that the selected countries have similar socio-economic and political structures.

**Table 2: Panel Regression: Effects of Fiscal Decentralization on Per Capital Income**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | | | | |
| Variables | ***Pooled OLS Model*** | ***Fixed Effect Model*** | ***Random Effect Model*** | ***Panel Feasible Generalized Least Squares Model*** |
| LOGEXDS | 0.3145\*\*\* (0.000) | -0.0749\*\* (0.028) | -0.0674\* (0.054) | 0.3146\*\*\* (0.080) |
| LOGREVDS | -0.2805\*\*\* (0.000) | -0.0396 (0.183) | -0.0421 (0.167) | -0.2806\*\*\* (0.000) |
| RGDPGR | -0.0174\*\*\* (0.000) | -0.0004 (0.705) | -0.0005 (0.646) | -0.0174\*\*\* (0.000) |
| IQI | 0.1120\*\*\* (0.000) | 0.0497\*\*\* (0.000) | 0.0551\*\*\* (0.000) | 0.1120\*\*\* (0.000) |
| Constant | 3.3541\*\*\* (0.000) | 3.5186\*\*\* (0.000) | 3.5122\*\*\* (0.000) | 3.3541\*\*\* (0.000) |
| Observation | 180 | 180 | 180 | 180 |
| Adjusted R-squared | 0.5139 | 0.2176 | 0.3993 |  |
| F-statistic | 48.31\*\*\* (0.000) | 11.54\*\*\* (0.000) |  |  |
| Wald Chi2 |  |  | 52.79\*\*\* (0.000) | 198.77\*\*\* (0.000) |
| Wald Chi2 test for Heteroscedasticity in Fixed Effect | | 307.04\*\*\* (0.000) |  |  |
| Wald Chi2 test for Serial correlation in Fixed Effect | | 71.991\*\*\* (0.000) |  |  |
| Hausman test | | 315.16\*\*\* (0.000) | |  |

*Source: Author’s computation (2025). PCI = Per capita income, EXDS = Expenditure decentralization share, REVDS = Revenue decentralization share, RGDPR = Real gross domestic product rates and IQI = Institutional quality. Note: \*\* and \*\*\* denote that the coefficients of the estimated variables are significant at 5 and 1 percent level of statistical significance*

**Estimated equation:** 

**Regression output from the Fixed Effect:**



**Regression output from the PFGLS:**



In this study, the dependent variable is per capita income (PCI) as a proxy for poverty. Per capita income is a commonly used economic indicator that measures the average income earned per person in a specific area, such as a country, region, or city, over a given period, typically a year. It is calculated by dividing the total income of the population by the total number of people (population). It is believed, on a priori grounds, that an increase in PCI enhances the welfare of the households and thus reduces poverty. It is therefore expected that an increased level of fiscal decentralization (both expenditure and revenue) would reduce poverty as it enhances upsurge in welfare (PCI).  Table 2 contains the panel regression results for the estimated parameters for the model; four different estimations have been done for the model. These include the Pooled Ordinary Least Squares or Panel Least Squares (POLS), the Fixed Effect (FE), the Random Effect (RE) model, and the Panel Feasible Generalized Least Squares (PFGLS). Based on the statistically significant value of the Hausman test, which is 315.16 (PV < 0.05), the best estimation for the model is the fixed effect (FE). Thus, the implied null hypothesis that the RE model is preferred is rejected in favor of the alternative hypothesis. This means that FE is the best for the model.

**Interpretation from the Fixed Effect Estimation for the Model**

The results from the FE in column 3 of Table 2 indicate that expenditure decentralization significantly reduces PCI, while revenue decentralization insignificantly shows a negative effect on PCI. For expenditure decentralization, the result indicates that a 1% rise in decentralized expenditure significantly leads to a 0.067% reduction in PCI. The implication is that a condition of inefficient allocation of resources can lead to misallocation of resources, especially in countries with weaker administrative capacity. Indeed, when the fiscal authorities at the local level prioritize projects that do not contribute significantly to economic growth, the per capita income of the households would reduce and thus increase poverty (Prud'Homme, 1995).

Also, inefficient revenue collection and associated corruption of revenue collectors could cause an insignificant impact of revenue decentralization. When the local governments or fiscal authorities lack the administrative capacity to efficiently collect revenues, the overall fiscal resources would decrease. This inefficiency can hinder the funding of essential public services and infrastructure, which, in turn, reduces PCI and increases poverty (see, for instance, Martinez-Vazquez et al., 2003, and Rodden and Jonathan, 2006, in this regard).

On the part of the growth rate of real GDP, the result also shows that the level of economic growth in the selected African countries insignificantly contributes to decreasing welfare (PCI) by 0.0004%. This could be possible when the distribution of economic growth is lopsided in terms of inequality. For institution quality (INQT), the result indicates that a 1% increase in IQI or governance efficiency significantly caused the level of PCI to increase by 0.049%. This would imply that the role of institutional quality in enhancing household welfare cannot be downplayed.

**Residual Diagnostic Tests for the Fixed Effect of the Model**

To ensure the validity of the results derived from the estimated fixed effect (FE) model, residual diagnostic tests for heteroscedasticity and serial correlation were conducted. Heteroscedasticity, a fundamental econometric issue, occurs when the variance of the error terms (residuals) in a regression model is not consistent across all levels of the independent variables. Ideally, the error variance should remain constant throughout the dataset. The Breusch-Pagan Wald-Chi-square test yielded a significant result (307.04, p-value < 0.05), providing evidence that the FE model in question suffers from the problem of heteroscedasticity. Additionally, the residual diagnostic test for serial correlation corroborated the presence of heteroscedasticity. Serial correlation, also referred to as autocorrelation, arises when the residuals in a regression model are correlated across observations. This implies that the error term of one observation is influenced by the error terms of previous observations, thereby violating the assumption of independence among the error terms. The Breusch-Godfrey Wald-Chi-square test also produced a significant result (71.991, p-value < 0.05), indicating the presence of serial autocorrelations in the estimated model.

These diagnostic results suggest that while the FE model has been interpreted, it faces significant challenges in the form of heteroscedasticity and serial correlation, which must be addressed to ensure robust and reliable findings. Since the fixed effects (FE) model exhibited residual issues, such as heteroskedasticity and serial correlation, it was deemed unsuitable for robust analysis. To address these problems, the study adopted the panel version of Feasible Generalized Least Squares (PFGLS), as outlined by Kariya and Kurata (2004). FGLS is effective in resolving these econometric issues, which violate classical least squares assumptions. The results from the FGLS model closely align with those obtained from the pooled ordinary least squares method, and the FGLS findings (Column 5 in Table 2) were subsequently interpreted for reliable insights.

**Interpretation from the Panel Feasible Generalized Least Squares (PFGLS) for the Model**

The Feasible Generalized Least Squares (FGLS) results indicate that expenditure decentralization (LOGEXDS) positively and significantly impacts the per capita income (PCI) of the households. Here, a 1% increase in expenditure decentralization is associated with a 0.3146% rise in PCI. This aligns with the expectation that higher levels of expenditure decentralization promote PCI growth, ultimately contributing to poverty reduction. These findings suggest that fiscally disciplined governments in the selected African countries can leverage expenditure decentralization to enhance PCI and address poverty effectively. The analysis reveals that revenue decentralization (LOGREVDS) has a significant adverse or negative impact on households’ welfare through reduction in per capita income. That is, a 1% rise in revenue decentralization causes PCI to decrease by approximately 0.281%. This suggests that revenue decentralization in the selected countries has not been effective in enhancing poverty reduction through PCI. Conversely, it can be seen that while the results indicate that expenditure decentralization positively influences PCI, leading to a 0.281% increase in PCI, implying a significant reduction in poverty, revenue decentralization rather decreases PCI, thereby increasing the level of poverty. The implication, therefore, is that the success of fiscal decentralization lies not in the mere allocation of revenue but in ensuring that expenditure is inclusive and directed toward enhancing the welfare of the households in the country.

The analysis indicates that the economic growth rate (RGDPGR), serving as a control variable in the FGLS model, has a notably negative effect on the PCI. Specifically, a 1% rise in RGDPGR leads to a 0.0174% decline in PCI. This suggests that economic growth in the sampled countries has failed to yield positive outcomes for PCI to increase and reduce poverty. For institutional quality, however, the estimated robust OLS through the FGLS model highlights the significant positive influence of institutional quality on PCI of the households in the sampled countries such that a 1% enhancement in governance results in an approximate significant positive effect of 0.112% improvement in PCI that would contribute to poverty reduction. These findings underscore the fact that economic growth alone may not have the desired capacity for poverty reduction, but with an efficient governance system, poverty can be reduced.

Inferring from the foregoing interpretations based on FE and the FGLS for the model, it can be concluded that the null hypothesis that fiscal decentralization does not significantly affect poverty using per capita income in selected African countries is rejected. This decision is based on the fact that the coefficients of fiscal decentralization, especially expenditure decentralization for sampled countries, significantly and positively improved PCI, which would reduce poverty. Again, the decision to accept or reject the null hypothesis in the model is based on the adjusted coefficient of the determination of the model (Adj. R2) and the value of the joint goodness of fit of the model measured through the overall F-statistics from the FE model and the Wald chi-square of the model from the FGLS. From the FE model, the value of the adjusted coefficient of the determination of the model (Adj. R2) is 0.2176 (21.8%), while that of the Pooled OLS, an equivalent of the FGLS, is 0.5139 (51.4%). These values, especially the 51.4% of the adjusted R² from the pooled OLS, show the overall variation in the dependent variable, PCI, as explained by the included independent variables in the models. Based on the F-stat. value of 48.31 (PV < 0.005) and the significant Wald chi-square of 198.77 (PV < 0.05), it is safe to conclude that fiscal decentralization significantly affects poverty using per capita income in selected African countries.

**Discussion of Findings**

Based on the findings from the FE estimation for the model, expenditure decentralization showed a significant negative effect on PCI, while revenue decentralization had an insignificant negative sign of effect on PCI. These findings correspond with the earlier study by Chygryn et al. (2018), who found the existence of a negative impact of fiscal decentralization on GNI per capita and aggravated inflation rates. Furthermore, this finding on the negative effects of fiscal decentralization on PCI corroborates with other earlier findings by Adediran et al. (2024), Fashanu and Olowe (2022), Siburian et al. (2022), and Celikay & Gumus (2017), among others. From the evidence of robust estimation, based on the Feasible Generalized Least Squares (FGLS), whose results are equivalent to the pooled OLS, expenditure decentralization, however, exhibits a significant positive effect on per capita income with the implication that poverty can be reduced when the per capita income of households in the sampled countries in Africa is increased. This positive effect of fiscal decentralization on PCI or welfare of the households is in consonance with the findings of other scholars, including, but not limited to, Hussen et al. (2021), Obo & Ugulu (2022), Sima et al. (2023), and Ying et al. (2024), among others. While the finding from the FE model is theoretically implausible, the finding from the FGLS corresponds to the a priori expectation that fiscal decentralization is welfare enhancing.

Furthermore, from the estimated parameters for the model, the coefficient for the institutional quality index (IQI) is positively significant in enhancing PCI of the households, thereby reducing poverty. This finding is in tandem with the position of Ligthart et al. (2015). These authors examined the relationship between the indicators of decentralization, such as public service provision and governance institutions, in 42 countries from 1994 to 2007 and found that there is a positive nexus between institutions and fiscal decentralization as well as public welfare (PCI).

**5. Conclusion**

The study examined the effect of fiscal decentralization on poverty in selected African countries from a per capita income perspective. The study employed panel regression analysis of the effects of fiscal decentralization on poverty in selected countries in Africa from 2006 to 2023. The results from the Hausman and Panel Feasible Generalized Least Square (PFGLS) are, however, preferred to the random effect and fixed effect, as its estimates are more robust. The choice of these estimates is hinged upon the nature of the data (T and N < 25); thus, the outcome of the Hausman test criterion is used. Also, the expenditure decentralization measure of fiscal decentralization has the capacity to increase the level of welfare of the citizens at the grassroots through the per capita expenditure. This implies that government fiscal decentralization policies for enhancing expenditures on essential social services for the local communities are critical for poverty reduction. Since revenue decentralization weakens poverty reduction efforts through PCI, it is important for the countries in Africa to foster increasing efforts to diversify the revenue sources of the countries in Africa.

In terms of the usage of per capita income (PCI) of the households as an indicator of poverty, this study found from the fixed effect model that expenditure (revenue) decentralization significantly (insignificantly) reduced PCI, thereby increasing poverty in the selected countries. These adverse effects of fiscal decentralization were moderated by the quality of institutions such that an increase in institutional quality led to a significant rise in PCI of the households, which further reduced the poverty rate among the sampled countries. Evidence from the robust model (FGLS) further showed that expenditure (revenue) decentralization significantly increases (reduces) PCI and consequently decreases (increases) poverty. By implication, expenditure decentralization meaningfully contributes to poverty reduction through increasing the rate of PCI, while revenue decentralization plays the opposite role of instigating poverty rate with a decreasing effect on PCI.

**Recommendations**

There is an urgent need for participatory governance where communities at the local levels can actively participate in fiscal decision-making for resource allocations to align with community needs. This process will enhance fiscal equalization measures that can address disparities in resource distribution between subnational governments and the local governments at the grassroots level. The findings of this study regarding the role of economic growth rate in moderating the impacts of real gross domestic product on poverty revealed that annual growth of the real GDP, which indicates economic expansion, does not necessarily translate into poverty reduction. This finding points to the possible existence of disparities or inequality in wealth distribution or the benefits of growth being concentrated in certain segments of governments. Therefore, there is a need for policies that will enhance growth inclusivity.

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