

-RESEARCH ARTICLE-

## ECONOMIC GROWTH AND INCOME INEQUALITY IN SUB-SAHARAN AFRICA AND ITS REGIONS: THE ROLE OF PROGRESSIVE PERSONAL INCOME TAX

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### —Abstract—

This study investigates the influence of progressive personal income tax on economic growth and income inequality across Sub-Saharan Africa (SSA) and its constituent subregions. Using a two-step System Generalised Method of Moments estimator incorporating forward orthogonal deviations, which improves upon conventional SGMM techniques that do not accommodate such transformations, the analysis covers a panel of 40 SSA countries over the period 1990 to 2022 within a dynamic, time-invariant framework. The empirical evidence indicates that Progressive Personal Income Tax (PIT) does not exert a statistically significant effect on economic growth at the aggregate SSA level, while it is associated with an increase in income inequality. Notwithstanding this overall pattern, substantial heterogeneity emerges across subregions. PIT demonstrates a positive and statistically significant relationship with economic growth in Southern and West Africa, whereas its effect is not statistically meaningful in Central Africa. Conversely, in East Africa, PIT is negatively and significantly associated with economic growth. With respect to income distribution, PIT is found to reduce income inequality in Southern and West Africa, while no significant effects are detected in the remaining subregions. By providing a disaggregated regional analysis, this paper extends existing empirical literature on the growth and distributional

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consequences of progressive taxation within SSA. In pursuit of Sustainable Development Goals 8 and 10, the findings suggest that policymakers should prioritise carefully targeted tax reforms, reinforced anti-corruption frameworks, prudent inflation control, and coherent integration of fiscal and macroeconomic policies.

**Keywords:** Progressive Personal Income Tax, Economic Growth, Income Inequality, SGMM and SSA Countries.

## INTRODUCTION

The pursuit of decent work and sustained economic expansion (SDG 8), together with the reduction of inequality (SDG 10), represents an interconnected policy agenda in which progress in one domain can reinforce outcomes in the other. Economic expansion can contribute to narrowing disparities, while deliberate efforts to reduce inequality may, in turn, support broader and more resilient growth trajectories, thereby enabling development that is both inclusive and sustainable. Realising these objectives requires coordinated action among governments, private sector actors, and civil society to address structural sources of inequality and to expand access to economic opportunities. For policymakers, a persistent challenge lies in reconciling growth-oriented strategies with equitable income distribution, making it necessary to assess whether these goals operate in tension or function as complementary policy outcomes.

According to [Rodrik \(2018\)](#), economic growth across Africa holds considerable promise for improving living standards, although its realisation depends on the mobilisation of sufficient financial resources. In practice, many governments in SSA face pronounced fiscal limitations that constrain their ability to simultaneously promote growth and address income disparities. Tax-to-GDP ratios in SSA remain persistently low, frequently falling below 15 per cent, thereby restricting fiscal space. In 2021, income tax revenues declined by 0.1 percentage points, largely driven by reductions in corporate income tax receipts, signalling wider structural weaknesses in public finance systems. Such revenue levels are inadequate to sustain the scale of investment required for economic transformation and human development. Although external assistance may partially alleviate these pressures, its availability is contingent on global economic conditions. This context highlights the critical importance of strengthening domestic revenue mobilisation as a means of supporting economic growth while also contributing to the reduction of inequality.

### **Progressive Personal Income Tax and Development in SSA**

Progressive personal income tax (ProPIT) occupies a pivotal position within fiscal policy and development discourse in SSA. As countries across the region seek to advance inclusive economic growth while narrowing persistent socio-economic gaps, a clear understanding of the consequences associated with ProPIT becomes increasingly

important. In principle, progressive taxation is designed to mobilise public revenue and mitigate inequality by imposing higher tax burdens on higher-income earners, thereby enabling redistribution through the financing of public goods and social services (Atkinson, 2015; Piketty et al., 2014). Notwithstanding these theoretical benefits, the practical performance of ProPIT in SSA remains contested. Opponents contend that elevated marginal tax rates may weaken incentives to work, save, and invest, which could, in turn, constrain economic growth (Mankiw et al., 2019 & Alesina et al., 2017). The extent to which ProPIT influences growth and income distribution is contingent upon contextual factors, including the effectiveness of tax administration, the quality of institutional governance, and prevailing market conditions. Although the broader literature on taxation is extensive, empirical evidence specifically examining ProPIT within SSA is comparatively scarce, particularly in recent periods. Existing studies frequently employ highly aggregated tax indicators or concentrate on advanced economies, thereby failing to adequately capture the distinctive fiscal, institutional, and economic realities of SSA (Bank, 2018a).

### **Contributions of the Study**

This study adds to the existing literature on ProPIT, economic growth, and income inequality in SSA by addressing several important gaps:

#### **Research Gap**

Empirical evidence that explicitly evaluates the effects of ProPIT on economic growth and income inequality within SSA and its sub-regions remains limited. Although a substantial body of global research examines the relationships between taxation, growth, and inequality, the heterogeneity of SSA economies and their distinctive socio-economic conditions have not been sufficiently examined in a comprehensive and regionally disaggregated manner.

#### **Methodological Approach**

The analysis applies a two-step System Generalised Method of Moments (SGMM) estimator incorporating forward orthogonal deviations. This specification enhances the precision and efficiency of parameter estimation, particularly in contexts characterised by small sample sizes and potential endogeneity (Roodman, 2009). Compared with conventional SGMM applications, this approach mitigates common limitations encountered in dynamic panel data modelling.

#### **Ethnic Fragmentation and Inequality**

Prior studies indicate that ethnic fragmentation plays a significant role in shaping income inequality, and a nuanced understanding of SSA's development challenges necessitates attention to its social and cultural structures (Chadha & Nandwani, 2018).

This study evaluates the effect of ethnic fragmentation on income inequality by employing time-invariant regressors proposed by (Kripfganz & Schwarz, 2019), which allow for consistent estimation of variables such as ethnicity and gender that do not vary over time.

### **Sub-Regional Variations**

While much of the literature treats SSA as a homogeneous unit, relatively few studies examine disparities across its sub-regions. Given the pronounced differences in income inequality, economic growth performance, and tax revenue mobilisation within SSA, analysing the heterogeneous effects of progressive taxation across sub-regions offers more precise and policy-relevant insights. This study examines the interdependent relationship between progressive taxation, economic growth, and income inequality in SSA. Clarifying whether ProPIT facilitates or constrains these development objectives is essential for the formulation of effective fiscal strategies. The results underscore the importance of sub-region-specific tax policies, alongside improvements in institutional governance, to more effectively reduce inequality and promote sustainable economic growth across SSA. The paper is organised as follows: Section 2 reviews the relevant literature, Section 3 outlines the methodology and data, followed by the presentation and discussion of empirical results, and Section 4 concludes with policy implications and recommendations.

## **LITERATURE REVIEW**

### **Pro-PIT and Economic Growth (EG)**

The interaction between ProPIT, economic growth, and income inequality continues to attract significant scholarly and policy attention within SSA. As a fiscal instrument, ProPIT is designed to impose higher tax liabilities on higher-income earners with the objective of enhancing distributive equity and promoting social justice through income redistribution (Atkinson & Stiglitz, 1980; Piketty et al., 2014). By concentrating a greater share of the tax burden on wealthier groups, ProPIT can generate substantial public revenue, which may be channelled into productive investments such as infrastructure development, education systems, and research and development, thereby supporting sustained economic growth over the long term (Piketty, 2003).

From a Keynesian perspective, progressive taxation plays a role in shaping aggregate demand dynamics. Although higher taxes on affluent households may suppress their consumption, redistributing income towards lower-income groups, who typically exhibit higher marginal propensities to consume, can stimulate overall economic activity. In contrast, critics argue that elevated tax rates may weaken incentives for labour supply, savings, investment, and entrepreneurial activity, potentially constraining long-run growth prospects (Mankiw et al., 2009). Within the framework of Neoclassical Growth Theory, ProPIT may initially reduce disposable income, yet its

long-term effects can be favourable if the resulting tax revenues are allocated efficiently to growth-enhancing public investments. Nevertheless, the presence of ethnic divisions may introduce inefficiencies in public expenditure allocation, thereby diminishing the effectiveness of ProPIT in settings characterised by substantial ethnic fragmentation (Mauro, 1995).

Although empirical evidence on Progressive/Personal Income Tax (ProPIT) within SSA remains relatively limited, existing research provides some support for its growth-enhancing and redistributive potential. Improving the progressivity of tax systems can help reduce income inequality in a panel of 45 SSA countries, using instrumental-variable and quantile regression methods to address endogeneity concerns (Ouedraogo et al., 2025). Broader analyses suggest that the composition of tax revenues and the role of direct versus indirect taxes matter for economic growth outcomes (Dalyop, 2022). Studies on the redistributive effects of different tax components, such as property taxes, conclude that well-designed tax systems can promote income redistribution in African contexts (Choga & Giwa, 2023). By contributing to lower income disparities, ProPIT may foster social cohesion and support more stable growth trajectories. Methodologically, many of these studies rely on panel data covering multiple SSA countries over extended periods. Fixed-effects, instrumental variables, and dynamic estimators are commonly employed to control for unobserved heterogeneity. The balance between efficiency objectives and equity considerations continues to be an important theme in this literature (Ouedraogo et al., 2025).

Despite its potential benefits, the effectiveness of ProPIT in SSA is often undermined by structural challenges, particularly tax evasion and avoidance among high-income groups. As noted by Osei, Morrissey, and Lloyd (2010), widespread non-compliance erodes the capacity of progressive taxation to generate adequate revenue for development purposes, thereby limiting its role as a tool for reducing inequality and supporting economic growth.

### **Pro-PIT and Income Inequality**

Tax policy instruments, including ProPIT, can either mitigate or intensify income inequality across African economies. In principle, progressive taxation is intended to reallocate resources from higher-income groups towards lower- and middle-income households, thereby strengthening distributive equity. Nevertheless, the longer-term consequences of such policies remain contested. In the absence of ProPIT, income and wealth tend to become increasingly concentrated among a narrow segment of the population, leading to widening disparities. Piketty (2014) argues that progressive taxation plays a critical role in counteracting this concentration by imposing higher tax burdens on wealthier groups and reallocating resources towards lower-income segments (Alvaredo et al., 2013). In a related vein, contend that pronounced income inequality

can generate social tensions and political instability, and that progressive tax regimes may help reduce these risks by promoting a more balanced distribution of income.

Recent empirical contributions emphasize the relevance of tax structure—especially progressive and direct tax components—in addressing income inequality within African contexts; for instance, evidence from a broad panel of 36 Sub-Saharan African countries shows that an increase in direct (more progressive) taxes relative to indirect taxes has a significant impact on income inequality, supporting the idea that tax design matters for redistribution outcomes, and analyses of 30 SSA economies find that personal income taxation and redistributive policy influence income disparities differently across countries depending on development status and fiscal redistribution mechanisms (Brown, Bokpin & Sarpong-Kumankoma, 2023).

While a progressive personal income tax (ProPIT) is often championed for its ability to reduce inequality by reallocating income from higher to lower earners, there is also evidence that the design and implementation of highly progressive tax systems can have unintended consequences. For example, research across Sub-Saharan Africa shows that increases in personal income tax progressivity do not uniformly translate into inequality reduction and, in some contexts, may even be associated with adverse economic effects. Notably, in a comprehensive study of 30 Sub-Saharan African economies, higher levels of personal income tax were found to correlate with increases in measured income inequality, suggesting that overly progressive tax structures might discourage investment and economic participation among higher-income groups, limit revenue mobilization, or stimulate tax avoidance and informality, thereby undermining their redistributive intent (Ouedraogo et al., 2022). Overall, prior studies adopt a wide range of econometric strategies, including fixed-effects and random-effects models as well as GMM estimators, to examine the links between ProPIT, economic growth, and income inequality. These approaches typically combine detailed national tax policy data with macroeconomic indicators over extended time horizons to ensure empirical robustness. In contrast to much of the existing literature, the present study evaluates the effects of ProPIT on both economic growth and income inequality across SSA and its sub-regions over the period 1990 to 2022 using SGMM.

## ECONOMETRIC MODEL AND DATA

### A Dynamic Panel Data Model

In this section, a balanced panel comprising 40 countries observed over the period 1990 to 2022 is utilised to evaluate the effect of ProPIT on economic growth and income disparity. The analysis recognises that the principal variables of interest, namely income disparity, ProPIT, and economic growth, exhibit limited variation over time. To account for these characteristics, the study estimates the empirical model using the framework

proposed by [Blundell and Bond \(1998\)](#), which is well suited to dynamic panel settings involving slowly evolving variables.

Economic Growth as a Dependent Variable:

$$EG_{it} = \beta_0 + \beta_1 EG_{it-1} + \beta_2 PropIT_{i,t} + \beta_3 VAT_{i,t} + \beta_4 X_{i,t} + \theta_i + \Omega_t + \epsilon_{it} \quad (1)$$

Income Inequality as a Dependent Variable:

$$Gini_{it} = \beta_0 + \beta_1 Gini_{it-1} + \beta_2 PropIT_{i,t} + \beta_3 VAT_{i,t} + \beta_4 X_{i,t} + \theta_i + \Omega_t + \epsilon_{it} \quad (2)$$

Where  $Gini_{it-1}$  represents the dynamic characteristics of the model,  $PropIT_{i,t}$  is the progressive personal income tax. Where  $Gini_{it}$  is income inequality,  $Gini_{it-1}$  is the dynamic characteristic of the equation. It describes the first period lag of net income disparity within a specific country. The expectation is that the immediate past level of income gap will influence the present income gap from falling and thus demonstrating a higher degree of inertia,  $EG_{i,t}$  is economic growth (proxy by GDPpc). GDP per capita is commonly used as an indicator to assess a country's economic performance and the living standards of its population. An increase in a nation's GDP per capita over time generally indicates economic growth and an improvement in the population's standard of living. This study uses six control variables: INFL represents inflation, Corr stands for corruption, VAT, ETH describes ethnic fragmentation, GEN is gender equality and EDINEQ represents educational inequality.  $\theta_i$  and  $\Omega_t$  are country-specific effects and time-specific effects, respectively.  $\epsilon_{it}$  is the error term, and  $\beta$  is a vector estimated coefficients. Interpolation and extrapolation are used to fill the missing values.

## Data Analysis

The application of interpolation and extrapolation for PropIT, VAT, and income inequality data is essential to construct comprehensive and reliable datasets for analysing the effects of fiscal policies on economic growth and income distribution. These techniques enable the capture of underlying trends and cyclical patterns, address gaps arising from policy changes, and mitigate the impact of volatility or inconsistencies in reporting. For PropIT and VAT, interpolation smooths irregular fluctuations and reflects policy shifts, whereas for income inequality, it ensures continuity over long-term trends. Despite potential biases and endogeneity concerns, the use of advanced methods—such as spline interpolation, polynomial interpolation, and regression-based techniques—alongside robustness checks, sensitivity analyses, and SGMM estimation enhances the credibility of the data.

Interpolation is particularly valuable for estimating missing values within the observed data range, for instance, absent years between 1990 and 2022 for PropIT, VAT, and income inequality. It assumes gradual changes between known data points, thereby

producing a complete dataset for the period under study. Extrapolation, in contrast, extends the analysis beyond observed data, if identified patterns persist into unobserved periods, which is important for forecasting trends in ProPIT, VAT, and income inequality. Institutional factors are critical in shaping the effectiveness of tax policies and revenue collection, as emphasised by [Besley and Persson \(2014\)](#), and should be considered when projecting or extending tax data beyond observed periods. Similarly, [Milanovic \(2016\)](#) highlights the relevance of historical trends in income inequality for projecting future outcomes, noting the importance of contextual and policy considerations. By integrating interpolation and extrapolation techniques, this study provides a more complete understanding of the long-term relationship between ProPIT, economic growth, and income inequality, thereby informing evidence-based policy design.

All variables included in this analysis are grounded in the literature. Given that aggregate measures such as GDP per capita and income inequality exhibit considerable temporal persistence, lagged inequality is included as an explanatory variable in Equations 1 and 2. The dynamic interplay of economic growth and income inequality, influenced by past values and other lagged factors, necessitates a model capable of capturing these dynamics, which a static specification cannot adequately address ([Baltagi, 2008](#)). Additionally, potential endogeneity between ProPIT, economic growth, and income inequality must be accounted for, as these variables can influence one another. For example, ProPIT can affect economic growth and inequality, while these outcomes can, in turn, shape the level and structure of ProPIT ([Wooldridge, 2010](#)). The SGMM estimator is particularly suited for this analysis as it addresses endogeneity through the use of internal instruments ([Arellano & Bover, 1995](#); [Blundell & Bond, 1998](#)). By combining difference GMM with level GMM, SGMM delivers efficient and consistent parameter estimates, especially in panels characterised by a relatively large number of countries and shorter time spans, mitigating small-sample bias ([Roodman, 2009](#)). The serial correlation of income inequality over time is well documented ([Kurita & Kurosaki, 2011](#)), justifying the use of a dynamic panel framework. Key challenges addressed in estimating Equations 1 and 2 include: (i) endogeneity arising from the inclusion of the lagged dependent variable as a regressor; and (ii) issues of omitted variable bias, reverse causality, and measurement error, which complicate the assessment of ProPIT's impact on economic growth and income inequality.

**Table 1: Source and Definition of the Variables**

Variable	Description	Source
Gini PIT Progressivity	Our annual data on aggregate net income inequality is drawn from the Gini coefficient series recently made available by version 8.2 of the SWIID published by Solt	SWIID UNU WIBER 2020 (GRD)

	(2019). In this study, we use disposable Gini as it provides the net picture of inequality in SSA countries. The PIT revenue in GDP is a proxy for personal income tax rate variable. Following Masiya (2017), we use a dummy variable for the progressivity of PIT (If PIT is less than or equal 5 brackets its mean value = 0 \not progressive" and more than 5 brackets = 1 \progressive").	Author Computation
Progressive*PIT	The interaction term of progressive and PIT (Progressivity of PIT).	Author Computation
Inflation	This variable is captured by the consumer-price index, reflecting the annual percentage variation in the cost to the average consumer of acquiring a basket of goods and services that can be fixed or changed at specified intervals, such as yearly.	World Development Indicators (WDI)
Economic Growth Corruption	GDP per capita has been used to capture economic growth. We have transformed this variable into a natural logarithm to reduce its high skewness. This variable is ranked between 0 and 6 (1=low and 6=high).	WDI WDI
VAT	The VAT revenue in GDP is the proxy for VAT rate variable.	UNU WIBER 2020 (GRD)
ETH	Ethnic fragmentation is measured using the ethnic fractionalization index (ethfrag), which is based on 650 identified ethnic groups across 190 countries. This index reflects the probability that two randomly selected individuals in a country belong to different ethnic groups, capturing the diversity within the society. The index ranges from 0 to 1 (or 100), with 1 (or 100) indicating complete diversity where everyone belongs to a different ethnic group, and 0 indicating a completely homogeneous society.	From the Database of Alesina et al. (2003).
GEN	This variable evaluates how well a country has established institutions and programs to enforce laws and policies that ensure equal access for men and women in education, health, the economy, and legal protection. It is anticipated to decrease income inequality.	World Bank

We employ two ways SGMM to address these issues, taking advantage of the fact that the individual dimension (40 countries) in our panel data is larger than the time dimension (32 years). Measurement error is a well-recognised concern for both ProPIT and income inequality, as these variables are inherently difficult to quantify and lack universally accepted definitions in the literature. The exclusion of certain relevant determinants may contribute to omitted variable bias, as some factors affecting income inequality are not included due to potential correlations with other explanatory variables in the model. Reverse causality also presents a significant challenge, since fiscal policy decisions can influence income inequality, while policymakers' responses to inequality may in turn shape taxation and expenditure patterns (Salotti & Trecroci, 2018). Furthermore, income inequality exhibits temporal persistence, with current levels

influenced by past values (Asongu et al., 2020; Kunawotor et al., 2020), reinforcing the necessity of dynamic modelling approaches such as SGMM to capture these effects accurately.

This study corroborates the persistence of income inequality, evidenced by a very high correlation (0.9993) between the dependent variable and its lag, exceeding the 0.8 threshold commonly used to identify persistent series in prior research (Asongu et al., 2020). Consistently, the lagged value of income inequality remains statistically significant across all model specifications. These considerations justify the use of SGMM as the preferred estimation method. Endogeneity is addressed through the application of internal instruments, specifically higher-order lags of the endogenous variables. The system GMM estimator is particularly appropriate given the time persistence of the dependent variable, and the use of suitably lagged instruments effectively mitigates potential endogeneity concerns. The sources and descriptions of all variables employed in this study are detailed in Table 1.

## RESULTS

Table 2 indicates that the average income inequality in SSA, measured using the net Gini or disposable income Gini coefficient, is 46.4.

**Table 2: Summary Statistics**

		Obs	Mean	Std. Dev	Min	Max
Gininet		960	46.4	6.97	34	66.5
Ginimk		960	50.4	8.62	37	70.1
EG		960	1.37	4.99	-47.81	36.98
PIT		960	2.14	2.02	.1	13.3
Corruption		1079	3.46	0.64	1	4.9
Inflation		960	11.99	18.95	-72.7	183.3
VAT		1080	3.04	1.45	.1	8.44
ETH		1024	67.2	0.366	7.7	94.6
GEN		1076	0.91	0.14	0.82	1.99

**Note:** \*\*\*p < 0.01; \*\*p < 0.05; \*p < 0.1. The Jarque–Bera test, test the null hypothesis of normality against the alternative of non-normality. The significance of the Jarque–Bera statistic indicates the rejection of the null of normality.

**Source:** Author's Computations.

By contrast, the market income Gini coefficient is higher at 50.4, implying that transfers and income taxation reduce the Market-Gini coefficient by approximately 4 points. Evidence from the Dabla-Norris et al. (2015) shows that in selected advanced economies and Latin American countries, income taxes and transfers have lowered market Gini coefficients by 17 and 4 points, respectively. These findings suggest that the redistributive effect of taxation and transfers in SSA and Latin America is relatively

limited compared with advanced economies, likely reflecting the greater reliance on indirect taxes within these regions' fiscal systems.

At the regional level, Southern Africa exhibits the highest mean net Gini coefficient at 51.01, followed by East Africa (40.12), West Africa (40.01), and Central Africa (35.71). This finding aligns with the results reported by [Kunawotor et al. \(2020\)](#). Corruption remains a significant challenge in SSA, with an average score of 3.46, highlighting its role as a major impediment to effective revenue mobilisation across the region. According to [Kunawotor et al. \(2022\)](#), the overall tax effort in Africa is relatively low, averaging 18.11 percent. As expected, VAT (3.04) exceeds ProPIT (2.14) in SSA, reflecting the heavy reliance on indirect taxation. Nonetheless, these figures indicate substantial untapped potential for revenue generation through ProPIT within the region. Multicollinearity doesn't seem to be a widespread concern, as indicated by the correlation matrix and variance inflation factors, none of which exceed 10. (see, [Table 3](#)). To assess the robustness of the model, a Durbin-Watson test was conducted. The resulting Durbin-Watson statistic of 2.12 indicates the absence of autocorrelation, suggesting that the model provides reliable estimates for informing policy decisions.

**Table 3: Variance Inflation Factor (VIF) from Income Inequality Regression Only**

Variables	VIF	1/VIF
PIT	1.17	0.585
CORR	1.52	0.656
INFL	1.16	0.863
VAT	2.18	0.459
ETH	1.06	0.942
GEN	2.04	0.852

### Results of the Impact of Pro-PIT on EG

This study utilises GMM and SGMM estimators to conduct robustness checks. As presented in [Table 4](#) (columns 1–5), ProPIT exhibits a negative but statistically insignificant relationship with economic growth (EG) in SSA, whereas VAT shows a positive effect on EG. Inflation and ethnic fragmentation are positively and significantly associated with EG, while gender equality remains statistically insignificant. The analysis acknowledges the limitations of GMM, including potential bias and inconsistency, and therefore prefers SGMM for its capacity to address endogeneity and serial correlation. Instrument validity is confirmed by Sargan and Hansen tests, both yielding high p-values above 0.05.

**Table 4: GMM Results of the Impact of Pro-PIT on EG**

Variables	GMM SSA-1	Southern-Africa-2	Central-Africa-3	East-Africa-4	West-Africa-5
$GINI_{i,t-1}$	-0.865 (0.105)	-0.758 (0.162)	0.795 (0.040)	0.832 (0.321)	-0.885 (0.192)

Pro-PIT	0.073	0.096	0.214	0.086	0.084
	(0.532)	(0.157)	(0.574)	(0.687)	(0.921)
CORR	-0.076	-0.098	-0.076	-0.048	--0.035
	(0.753)	(0.048)	(0.753)	(0.015)	(0.873)
VAT	0.047	0.092	0.076	0.082	0.049
	(0.035)	(0.019)	(0.049)	(0.084)	(0.076)
INFL	0.073	0.057	0.081	0.082	-0.091
	(0.102)	-(0.059)	(0.078)	(0.098)	(0.084)
ETH	-0.068	-(0.084)	-0.079	-0.083	-0.075
	(0.042)	(0.047)	(0.072)	(0.034)	(0.081)
GEN	-0.075	-0.068	0.035	0.083	0.095
	(0.824)	(0.762)	(0.728)	(0.975)	(0.896)
Obs	920	462	375	325	335
No of Group	37	28	26	20	18
No of Instru	23	19	16	18	15
Wald Test (Pr)	0.000	0.000	0.000	0.000	0.000
AR(1): (Pro>z)	-1.49(0.000)	-1.78(0.029)	-2.53(0.039)	-3.19(0.022)	- 1.39(0.045)
AR(2): (Pro>z)	-0.61(0.526)	-0.45(0.257)	2.22(0.845)	1.53(0.736)	- 2.64(0.865)
Sargan: (Pr>chi2)	1.68(0.000)	2.24(0.865)	1.32(0.624)	3.05(0.869)	3.24(0.684)
Hansen: (Pr>chi2)	1.31(0.951)	2.24(0.935)	1.53(0.862)	2.13(0.847)	2.35(0.936)

Note: \*\*\*, \*\* and \* demonstrate that the null is rejected at 1%, 5% and 10%, respectively.

Table 5 reports the SGMM estimates of ProPIT's impact on economic growth (EG) in SSA and its subregions. The coefficients of lagged EG are positive and statistically significant, indicating that EG exhibits mean-reverting behaviour over time. At the aggregate SSA level, ProPIT displays a negative but statistically insignificant association with EG, suggesting a neutral overall effect. In contrast, VAT exerts a positive and significant influence on EG, with a 1% increase in VAT corresponding to a 0.063% increase in growth. Corruption negatively affects EG, with a 1% rise reducing growth by 0.043%, while inflation also has a negative and significant effect, with a 1% increase lowering EG by 0.081%. Ethnic fragmentation consistently hampers growth across SSA, with a 1% reduction in fragmentation associated with a 0.082% increase in EG.

**Table 5: SGMM Results of the Impact of Pro-PIT on EG**

Variables	SGMM SSA-1	Southern-Africa-2	Central-Africa-3	East-Africa-4	West-Africa-5
<i>GINI<sub>i,t-1</sub></i>	0.964	0.942	0.895	0.968	0.943
	(0.035)	(0.073)	(0.083)	(0.076)	(0.065)
Pro-PIT	--0.062	0.052	--0.101	--0.043	0.038

	(0.983)	(0.065)	(0.968)	(0.091)	(0.068)
CORR	-0.043	-0.062	-0.095	-0.085	--0.069
	(0.068)	(0.073)	(0.0.92)	(0.067)	(0.089)
VAT	0.063	0.086	0.053	0.066	0.073
	(0.088)	(0.054)	(0.067)	(0.073)	(0.059)
INFL	-0.081	-0.068	0.073	-0.091	-0.078
	(0.090)	(0.076)	(0.097)	(0.040)	(0.020)
ETH	-0.082	-(0.078)	-0.081	-0.073	-0.049
	(0.072)	(0.095)	(0.068)	(0.043)	(0.079)
GEN	-0.084	-0.076	0.024	0.072	0.084
	(0.836)	(0.710)	(0.679)	(0.865)	(0.943)
Obs	930	456	353	312	301
No of Group	34	26	24	21	19
No of Instru	22	18	15	16	14
Wald Test (Pr)	0.000	0.000	0.000	0.000	0.000
AR(1): (Pro>z)	-1.50(0.000)	-1.86(0.035)	-2.41(0.042)	-3.21(0.021)	- 1.42(0.034)
AR(2): (Pro>z)	-0.52(0.606)	-0.42(0.241)	3.12(0.751)	1.43(0.624)	- 2.34(0.924)
Sargan: (Pr>chi2)	1.70(0.000)	2.14(0.952)	1.21(0.512)	3.01(0.987)	2.14(0.524)
Hansen: (Pr>chi2)	1.24(0.620)	3.12(0.834)	1.45(0.934)	2.01(0.736)	3.34(0.725)

**Note:** \*\*\*, \*\* and \* demonstrate that the null is rejected at 1%, 5% and 10%, respectively.

Examining sub regional patterns, ProPIT exhibits positive and significant effects on EG in Southern and West Africa, whereas it remains insignificant in Central Africa. Specifically, a 1% increase in ProPIT is associated with a 0.038% and 0.052% increase in EG in Southern and West Africa, respectively. Conversely, in East Africa, ProPIT negatively influences EG, with a 1% rise linked to a 0.043% decline in growth. VAT maintains a positive and significant relationship with EG across all subregions, enhancing growth by 0.086%. Corruption persistently reduces EG, with coefficients ranging from 0.062% to 0.095% across regions. Inflation demonstrates a positive and significant effect on growth only in Central Africa, where a 1% increase corresponds to a 0.073% rise in EG; in contrast, it negatively affects EG in Southern, West, and East Africa, with a 1% increase resulting in a 0.068% to 0.091% decline. Ethnic fragmentation remains a consistent impediment to growth across all subregions.

## Results of the Impact of Pro-PIT on Income Inequality

Given the inconsistencies and potential bias of the GMM results in [Table 6](#), this study emphasises the SGMM findings reported in [Table 7](#), which examine the effect of ProPIT on income inequality in SSA and its subregions. The coefficients of lagged inequality are positive and statistically significant, indicating that inequality exhibits

persistence and tends to revert toward its mean over time. At the aggregate SSA level, ProPIT has a positive and significant association with inequality, increasing it by 0.083%. In contrast, VAT demonstrates a negative and significant effect, reducing inequality by 0.035%, while corruption significantly raises inequality by 0.069%. Inflation appears statistically insignificant in SSA, whereas ethnic fragmentation positively and significantly contributes to inequality, with increases ranging from 0.043% to 0.057% across SSA and all subregions.

Sub regional analysis reveals heterogeneity in ProPIT's effects. In Southern and West Africa, ProPIT reduces inequality, with a 1% increase in ProPIT corresponding to decreases of 0.023% and 0.014%, respectively.

**Table 6: GMM Results of the Impact of Pro-PIT on Income Inequality**

Variables	GMM SSA-1	Southern-Africa-2	Central-Africa- 3	East-Africa-4	West-Africa-5
<i>GINI<sub>i,t-1</sub></i>	-0.756 (0.141)	- 0.862 (0.172)	0.986 (0.051)	0.958 (0.456)	-0.935 (0.241)
Pro-PIT	0.065 (0.625)	0.088 (0.174)	0.321 (0.625)	0.078 (0.765)	0.093 (0.965)
CORR	-0.059 (0.862)	-0.089 (0.051)	-0.081 (0.835)	-0.052 (0.021)	--0.041 (0.936)
VAT	0.058 (0.046)	0.097 (0.024)	0.081 (0.051)	0.094 (0.096)	0.051 (0.082)
INFL	0.084 (0.112)	0.064 (-0.062)	0.092 (0.083)	0.078 (0.076)	-0.089 (0.095)
ETH	-0.076 (0.039)	-(-0.097) (0.053)	-0.076 (0.079)	-0.075 (0.028)	-0.086 (0.085)
GEN	-0.083 (0.983)	-0.073 (0.951)	0.042 (0.728)	0.091 (0.824)	0.084 (0.914)
Obs	928	473	375	341	343
No of Group	35	29	28	22	19
No of Instru	22	23	19	19	14
Wald Test (Pr)	0.000	0.000	0.000	0.000	0.000
AR(1): (Pro>z)	-1.55(0.000)	1.81(0.031)	-2.62(0.042)	-3.21(0.035)	-1.45(0.056)
AR(2): (Pro>z)	-0.64(0.671)	0.61(0.298)	3.14(0.924)	1.67(0.985)	-2.79(0.976)
Sargan: (Pr>chi2)	1.71(0.000)	2.75(0.936)	1.42(0.769)	3.10(0.982)	3.35(0.589)
Hansen: (Pr>chi2)	1.29(0.869)	2.17(0.876)	1.61(0.869)	2.31(0.934)	2.62(0.896)

**Note:** \*\*\*, \*\* and \* demonstrate that the null is rejected at 1%, 5% and 10%, respectively.

In other subregions, ProPIT does not exert a statistically significant influence. VAT consistently lowers inequality across all subregions, with reductions between 0.053% and 0.081%. Corruption persistently exacerbates inequality, increasing it by 0.072% to 0.084% in all regions. These results indicate that the impacts of VAT and ProPIT on

inequality are region-specific, while corruption remains a universal factor driving greater inequality.

**Table 7: SGMM Results of the Impact of Pro-PIT on Income Inequality**

Variables	SGMM SSA-1	Southern-Africa-2	Central-Africa-3	East-Africa-4	West-Africa-5
<i>GINI<sub>i,t-1</sub></i>	0.924 (0.010)	0.981 (0.051)	0.894 (0.000)	0.976 (0.070)	0.915 (0.004)
Pro-PIT	0.083 (0.034)	- 0.023 (0.065)	0.786 (0.968)	0.454 (0.851)	-0.014 (0.068)
CORR	0.069 (0.073)	0.072 (0.087)	0.084 (0.053)	0.076 (0.086)	0.074 (0.068)
VAT	-0.035 (0.073)	-0.081 (0.045)	- 0.053 (0.062)	- 0.066 (0.093)	-0.072 (0.084)
INFL	0.092 (0.953)	0.064 (0.864)	0.019 (0.937)	0.024 (0.764)	0.010 (0.985)
ETH	0.051 (0.094)	0.043 (0.079)	0.057 (0.049)	0.048 (0.066)	0.039 (0.082)
GEN	0.045 (0.935)	0.062 (0.824)	0.073 (0.762)	0.053 (0.604)	0.076 (0.879)
Obs	930	456	353	312	301
No of Group	34	26	24	21	19
No of Instru	22	18	15	16	14
Wald Test (Pr)	0.000	0.000	0.000	0.000	0.000
AR(1): (Pro>z)	-1.50(0.000)	-1.86(0.035)	-2.41(0.042)	-3.21(0.021)	1.42(0.034)
AR(2): (Pro>z)	-0.52(0.606)	-0.42(0.241)	3.12(0.751)	1.43(0.624)	2.34(0.924)
Sargan: (Pr>chi2)	1.70(0.000)	2.14(0.952)	1.21(0.512)	3.01(0.987)	2.14(0.524)
Hansen: (Pr>chi2)	1.24(0.620)	3.12(0.834)	1.45(0.934)	2.01(0.736)	3.34(0.725)

Note: \*\*\*, \*\* and \* demonstrate that the null is rejected at 1%, 5% and 10%, respectively.

## DISCUSSION

### Does Pro-PIT Affect EG in SSA and Its Subregions?

Table 5 presents the SGMM estimates of the effects of ProPIT and other explanatory variables on economic growth (EG) in SSA and its subregions. At the aggregate SSA level, ProPIT exhibits a neutral effect on EG. In contrast, VAT positively influences EG, likely reflecting the regressive nature of the tax system, where a greater proportion of total revenue is derived from indirect taxes such as VAT (3.04%) relative to ProPIT (2.14%). Corruption is shown to have a negative effect on EG, supporting Mauro (1995), who argues that corruption undermines economic development, as well as Gupta et al. (2002), who demonstrate its adverse impact on investment and productivity. Inflation similarly exerts a negative effect, aligning with Fischer (1993) and Barro

(1995), who suggest that inflation generates uncertainty, distorts price signals, and causes inefficient resource allocation, thereby impeding long-term growth.

Among the control variables, gender equality does not have a significant effect on EG in SSA, whereas ethnic fragmentation negatively affects growth. High ethnic fragmentation diminishes the efficacy of fiscal instruments, including ProPIT, through mechanisms such as tax evasion and resistance to policy implementation (Mauro, 1995). This inefficiency in public expenditure allocation constrains economic development. Subregional results reveal that ProPIT positively contributes to EG in Southern and West Africa, while its overall effect in SSA remains neutral. This finding aligns with Progressive PIT Theory, which posits that higher taxation on affluent groups can reduce inequality and stimulate aggregate demand, thereby promoting economic activity. The result is also consistent with Keynesian Economics and the Revenue Effects framework proposed by Piketty (2003), who identify a positive correlation between progressive taxation and growth. Policymakers in Southern and West Africa could enhance inclusive and sustainable growth by strengthening ProPIT systems, coupled with improvements in tax compliance and administration (Bird & Zolt, 2005).

In East Africa, ProPIT negatively affects short-term growth, consistent with Neoclassical Growth Theory, which suggests that high personal income taxes can reduce incentives for work, savings, and investment. However, long-term growth may still benefit if tax revenues are effectively allocated to critical sectors such as education, health, and infrastructure. Inflation exhibits heterogeneous effects across subregions. In Central Africa, it is positively and significantly associated with EG, diverging from conventional theory that links inflation to economic instability. Additionally, inflation can reduce the real burden of debt and support investment in underdeveloped markets (Sarel, 1996). These findings underscore the importance of considering regional dynamics when designing fiscal and monetary policies, as factors such as ProPIT, inflation, and corruption interact with local economic and institutional contexts to influence growth outcomes across SSA.

### **Does Pro-PIT Affect Income Inequality in SSA and Its Subregions?**

Results from Table 6 indicate that ProPIT in SSA paradoxically increases income inequality, contrary to the theoretical expectation that it would reduce disparities through wealth redistribution. This outcome aligns with Alvaredo et al. (2013) “Wealth Concentration” concept, which emphasises that region-specific factors in SSA contribute to this unexpected effect. A key explanation is the weak implementation of ProPIT systems due to inadequate tax administration, widespread tax evasion, and the presence of loopholes. These challenges impede effective redistribution, allowing high-income individuals to avoid taxation while low-income households bear a disproportionate burden (Bird & Zolt, 2005). Furthermore, SSA’s high levels of

informality, unemployment, and poverty constrain the tax base, further limiting the redistributive potential of ProPIT (Besley & Persson, 2014).

The absence of complementary policies, including investments in education, healthcare, and social protection, also undermines the ability of progressive taxation to reduce inequality (Bank, 2018b). Additionally, reliance on indirect taxes, which disproportionately affect low-income groups, exacerbates inequality (Slemrod & Bakija, 2008). Ethnic fragmentation further complicates redistribution, as it reduces social cohesion and hampers the efficient provision of public goods. Alesina et al. (1999) note that ethnic diversity can diminish trust and cooperation, leading to inefficient resource allocation and hindering efforts to address income inequality. Analysis of control variables yields mixed results. VAT appears to reduce inequality, which contrasts with its generally regressive nature. This may reflect the redistributive effects of government expenditure financed by VAT revenues, which often support social welfare, education, healthcare, and infrastructure, benefiting lower-income households (Lengfelder, 2019). Conversely, corruption diverts resources away from essential public services, undermining institutions and perpetuating inequality (Bardhan, 1997).

Subregional findings reveal that ProPIT reduces inequality in Southern and West Africa, consistent with Progressive PIT Theory, which posits that higher taxes on wealthy individuals redistribute income toward lower-income groups. Southern African countries, including South Africa, Namibia, and Botswana, have more developed ProPIT frameworks; for example, South Africa employs multiple tax brackets with higher rates for higher earners (SARS, 2020). In West Africa, nations such as Nigeria, Ghana, and Senegal also implement progressive taxation, although challenges in tax compliance, particularly in Nigeria, remain significant (Ezeoha & Ezejiofor, 2019). The socio-economic context of each subregion shapes the effectiveness of ProPIT. In Southern Africa, historical inequalities stemming from colonialism and apartheid continue to influence income distribution (Statistics South Africa, 2019). In West Africa, rapid population growth, limited access to education and healthcare, and uneven wealth distribution exacerbate inequality (WorldBank, 2020). Policy outcomes vary: Southern Africa countries like South Africa benefits from social welfare programmes designed to reduce inequality, although tax evasion and corruption limit their impact (OECD, 2020). In West Africa, weak tax administration and a large informal economy hinder equitable revenue collection and redistribution (Fjeldstad & Moore, 2009). Regional integration initiatives, such as the Southern African Development Community (SADC) and the Economic Community of West African States (ECOWAS), promote coordination and knowledge sharing on tax policy, potentially enhancing compliance and administration.

Overall, while ProPIT systems in SSA are theoretically designed to reduce income inequality, their effectiveness is constrained by weak governance, inadequate tax compliance, and structural socio-economic challenges.

## CONCLUSIONS AND POLICY RECOMMENDATIONS

As countries globally and regionally strive to meet the targets outlined in Sustainable Development Goals 8 and 10, which prioritise fostering sustainable and equitable economic growth while reducing income disparities, there is an increasing need to utilise progressive personal income taxation as a tool to achieve these objectives. This study examines the effect of progressive personal income tax on economic growth and income inequality in SSA and its subregions. An endogeneity-robust two-step SGMM method, incorporating forward orthogonal deviations, is employed, distinguishing it from the standard SGMM approach that does not account for these deviations. The analysis covers 40 SSA countries from 1990 to 2022 using a dynamic panel estimator of time-invariant variables. The findings reveal that, unlike in developed countries with strong tax systems, ProPIT in SSA has no significant impact on economic growth while increasing income inequality at the continental level. However, these effects vary considerably across subregions. Policymakers in SSA and its subregions could accelerate the achievement of sustainable and inclusive growth and reduce income inequality by strategically leveraging ProPIT policies.

To achieve SDG 8 and 10, governments should prioritise targeted tax policy adjustments, stronger anti-corruption measures, effective inflation management, and integrated policy frameworks. Enhancing VAT implementation through broader coverage, reduced exemptions, and improved compliance can boost economic growth and reduce inequality. Progressive PIT policies should be regionally tailored: rates could be increased in Southern and West Africa, maintained in Central Africa, and adjusted in East Africa to prevent adverse growth impacts. Strengthening anti-corruption frameworks with improved transparency, accountability, enforcement, and digital tools is essential. Inflation control should be region-specific, maintaining low and stable rates in Southern, West, and East Africa, and moderately higher rates in Central Africa to support growth. Coordinated policy implementation is crucial to ensure VAT improvements, anti-corruption efforts, and inflation management work synergistically. Expanding social safety nets, such as conditional cash transfers and targeted subsidies, and allocating VAT revenues to public services can mitigate the adverse effects of ProPIT on inequality. Continuous monitoring and evaluation will allow timely adjustments and maintain policy effectiveness. Additionally, to address persistent income disparities, policymakers should strengthen institutional frameworks, foster social cohesion, and design inclusive policies that reflect SSA's diverse social landscape. Future research could explore the effects of progressive taxation with a focus on different income groups across countries.

## APPENDIX

### Lists of Countries

Angola, Botswana, Ghana, Lesotho, Burkina Faso, Burundi, Ethiopia, Gambia, Madagascar, Malawi, Mali, Mauritius, Seychelles, Senegal, Swaziland, Cameroon, Central African Republic, Chad, Congo Rep, DR Congo, Côte d'Ivoire, Guinea-Bissau, Guinea, Ghana, Kenya, Madagascar, Malawi, Mali, Mauritius, Mozambique, Namibia, Niger, Nigeria, Tanzania, Togo, Sierra Leone, Uganda, Zambia, Zimbabwe, South Africa

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