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Income inequality, structural change, and inclusive economic growth

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ABSTRACT

Sub-Saharan African countries have experienced significant structural change and economic growth in recent decades; however, inequality levels remain high, raising concerns that the growth is not inclusive enough to reduce inequality levels. This study explores the effect of economic growth and structural change on income inequality using a panel dataset of 40 sub-Saharan African countries over the period 2001-2015. The study employs the iterated Generalized Method of Moment (GMM) estimator for analysis. The findings suggest that although increased income levels in the region fuel inequality, the transition of the economies towards the services sector could reduce income inequality. However, the overall contribution of structural change to reducing inequality levels has been minimal suggesting that the growth experiences of the region, especially over the last two decades, may not have been inclusive; hence, the need for enhanced redistributive policies to deepen inclusivity of the growth process.

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Economic growth; inequality; Africa; Kuznets; structural change; inclusive growth

JEL CLASSIFICATION C33; D63; N37

Introduction

In the context of inclusive growth, studies on the relationship between income inequality and growth have focused extensively on the Kuznets hypothesis with the findings largely inconclusive (Banerjee & Duflo, 2003). Countries' experiences on the relationship between growth and inequality differ and do not appear to provide satisfactory answers to a definite relationship (Aghion et al., 1999; Barro, 1999). Despite the substantial research and debate on the relationship between inequality and economic growth, the relationship remains complex and insufficiently understood, often yielding mixed results because of the varying dynamics within and across countries (UN-DESA, 2023).

Concerns have been raised about inclusive growth in sub-Saharan Africa (SSA). There is a wider consensus that inclusive growth is necessary for reducing income inequality in developing countries. Sustained growth is necessary for poverty and inequality reductions and enhanced social equity. Despite impressive growth over the last three decades, inequality levels in SSA countries have remained high or worsened (Ordu, 2023). This

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could be attributed to the limited distributive policies in the region caused in part by the influence of abundant natural resource rents on redistributive tax policy choices (Niño-Zarazúa et al., 2023). Moreover, few African countries have robust tools and consistent policy frameworks for addressing inequality (Morsy et al., 2023) and macroeconomic reform measures (such as liberalisation and deregulation) could lead to higher inequality (Ostry et al., 2018). Also, inequality levels may be underpinned by historical and cultural factors that have made redistributive policies less effective (Adesina, 2017; UNESCO, 2016). In addition, Shimeles and Nabassaga (2017) identified inequality of opportunities (such as education), political governance and ethnic fractionalization as some of the main causative factors of high inequality in the region. Atamanov et al. (2024) suggest that there is still more to know about the dynamics of inequality in SSA and that inequality levels may be higher than previously reported.

The role of structural change in inequality dynamics has not received much attention in the empirical literature despite having a strong theoretical underpinning. For growth to be wholly inclusive, it must involve structural transformation (reallocation of resources that accompanies growth) (Islam & Iversen, 2018; United Nations Research Institute for Social Development [UNRISD], 2017). However, growth without substantial structural change is a possibility (Dorosh et al., 2012; Schmitt, 1990). For instance, growth may be within a sector (labour productivity growth in sectors without significant changes in sectoral employment). The effect of structural change on inequality is often subsumed in the effect of economic growth, suggesting issues of omitted variable bias. This paper demonstrates that although structural change has contributed little to reducing inequality levels because the countries are at the early stages of transformation, increased reallocation of labour to the non-agriculture sectors, especially services, could help reduce inequality levels. Growth in aggregate income could be a causal variable in the Kuznets hypothesis but could also moderate the effect of structural change on inequality levels. Also, most studies on inclusive growth in SSA have focused on countrylevel dynamics. Building on this, this paper highlights cross-country heterogeneity and persistent inequality patterns across the various income groups in SSA. Interestingly, inequality across countries appears to be underpinned by high inequality levels within countries rather than differences in aggregate growth.

Thus, this paper broadly contributes to the complex debate on inequality by empirically examining the role of structural change on the dynamics of inequality in SSA. Further, the moderating role of structural change on the Kuznets inequality hypothesis in the context of SSA countries is explored. The findings of this study have significant implications for policy measures aimed at improving inclusive growth and inequality reduction through measures such as redistribution policies.

Concept of inclusive growth

Inclusive growth is broadly defined as broad-based economic growth that encompasses all sectors of the economy and allows all segments of the population to contribute and share in the benefits of economic growth. Inclusive growth has two key defining features: (i) Shared growth or prosperity – a growth process that is distributive across all sectors and connected to reductions in poverty and inequality; and (ii) Structural change – a growth process that allows innovations, sustained productivity growth and reallocation of resources from low-productive to high-productive sectors (Ianchovichina & Lundstrom Gable, 2012; Klasen, 2010; Rauniyar & Kanbur, 2009; Samans et al., 2017).

Inclusive growth is connected to the dynamics of the growth process (patterns and pace of growth). It entails increased employment opportunities alongside declining opportunity inequality. At the broad policy levels, inclusive growth may include a propoor growth process – a growth process that raises the income of the poor relative to the income of the high-income classes. This growth process reduces inequality levels across the population and can be *absolute* or *relative*. Absolute pro-poor growth is a growth process that benefits the poor in absolute terms, which means poverty reduction. Relative pro-poor growth means that the poor benefit more from growth than the upper-income classes – a reduction in inequality. Ianchovichina and Lundstrom Gable (2012) argue that inclusive growth is more consistent with absolute pro-poor growth than relative propoor growth. However, in practice, inclusive growth in the long-term entails structural change and changes in institutional infrastructure and policies that may deliver both poverty and inequality reduction. Indeed, policies of inclusive growth often focus on both absolute pro-poor growth (poverty reduction) and relative pro-poor growth (reduction in inequality). The two are deemed mutually inclusive (Balasubramanian et al., 2021; Centre for Progressive Policy, 2019; Ivanyna & Salerno, 2021; OECD, 2018).

Beyond the Kuznets hypothesis - income inequality and structural change

The Kuznets hypotheses suggest an inverted U-shape relationship between inequality and growth. It has been the theoretical reference point for the relationship between inequality and economic growth. However, this relationship remains at the theoretical levels and often fails to offer empirical support for the variations of inequality and growth across countries. In some cases, growth in aggregate income coupled with redistribution policies has raised household income levels and narrowed inequality and poverty gaps (OECD, 2018).

Kuznets (1955) argues that structural change is the basis of the evolution of inequality in most countries. The per capita income of rural dwellers (mostly in agriculture and the informal sector) is low compared to per capita income in the urban centres and relatively formal sectors like industry and services. Inequality in least-developed countries could be low because production is centred around the agriculture sector and the informal economy. Large shares of labour work in these sectors with relatively low income.

However, as the economy grows, labour begins to move out of agriculture to industry and eventually to services. The so-called modern sectors (industry and services) usually require high-skilled labour, thereby commanding high per capita income. Because of skilled labour demand in the formal sectors and the differences in skill levels in the labour force, inequality emerges in the industry and services sectors. The differences in the per capita income in these modern sectors and agriculture also create inequality across sectors. Barro (1999) posits that as people move into industry, per capita income levels increase across sectors, but at the same time, inequality in income levels across sectors also increases. This creates a positive relationship between inequality and economic growth in the early stages. With continuous structural change, the decreasing share of labour in agriculture eventually raises the per capita income in the sector. In the industry and services sectors, labour can hierarchically move from low to high incomes through skills acquisition, experience, and specialisation, thereby reducing inequality levels in the sectors. As the income level equalises, inequality gradually declines, thereby creating a negative relationship between economic growth and inequality. These scenarios are the theoretical basis of the Kuznets curve, which shows an inverted U-shaped relationship between inequality and economic growth.

Recent studies on the relationship between inequality and economic growth along the lines of structural change have considered the role of technological innovations, effects of globalisation, financial intermediation, and urbanisation (Caraballo et al., 2017; Panizza, 2002). For instance, the industrial sector may be faster in absorbing technology than agriculture (UNESCAP, 2018). Baymul and Sen (2020) find that the reallocation of labour to manufacturing reduces inequality irrespective of the level of structural transformation, while the movement of labour to services may positively influence inequality in countries at the early stages of structural transformation and negatively impact inequality at the later stages. This suggests that the Kuznets hypothesis may be more pronounced in services-driven structural change than in manufacturing-driven structural change. İşcan and Lim (2022) find that labour reallocation from agriculture increased inequality levels in Korea. These findings illustrate that the causal relationship between inequality and growth could be mixed, depending on country-level dynamics. Also, while distributive policies could work at some stages of growth, their impact and effectiveness could change over time along the path of structural transformation (Clementi et al., 2022; Kanbur, 2017; UNESCO, 2016). For developing countries, especially in SSA, it is important to understand whether the early structural change (characterised by the movement of labour from agriculture to industry) and premature deindustrialization (declining labour share of the industry at low-income levels) have contributed to heightening inequality levels.

Model

Inequalities within countries mirror inequalities across countries (Milanovic, 2008). Consider the income of a country distributed over n income classes of the population in ascending order:

$$Y_i = f(Y_1, Y_2, Y_3 \dots Y_n) \tag{1}$$

where Y_1 is the bottom class. This means, on average, all other individuals in the country have some level of income that classifies them into certain income classes. For instance, the income share of an individual, j, puts them into a certain income class, n. Thus, the aggregate income of a country is the summation of the income shares of individuals, j, or the income share of income classes n of the population, which is defined according to income thresholds. This may be summarised as:

$$Y_i = \sum_n Y_n = \sum_j Y_j \tag{2}$$

The Gini coefficient of income distribution in a country i may be expressed as the aggregate of the weighted income shares (Paul, 2004).

$$G_i = \sum_n \beta_n Y_n(Y_i) \tag{3}$$

where $\beta_n Y_n$ is the weighted share of income class *n* in aggregate income.

The basic model for evaluating the effect of aggregate income on the income distribution may then be expressed as:

$$Y_{nt} = \beta_0 + \beta_1 y_{nt-1} + \beta_2 y_{it} + \beta_3 y_{it}^2 + \beta_4 S_{it} + \beta_5 \log S_{it} \cdot \log y_{it} + \beta_6 W_t + \pi_i + \delta_t + \mu_t \quad (4)$$

where Y_{nt} is the income share, and y_{it} is the per capita income. y_{nt-1} is the lagged income share to control for the effect of past income shares on current income shares, y_{it}^2 controls for a non-linear relationship between aggregate growth and income shares. In countries with higher and rising inequality levels, y_{it} and y_{it}^2 will be more positively associated with the top income share compared to the bottom income share. S_t is the sectoral labour share to control for structural change, and W_t is a vector of control variables. $S_{it}.y_{it}$ captures the interaction effect of structural change and growth on income shares (more discussion on the explanatory variable is presented under Equation 5). π_i and δ_t are country and time effects. Mobility across income groups is reflected in the changes in the magnitude or evolution of the differences between the income shares.

In the context of the Kuznets hypothesis, in the first stage of structural change, those at the lower income level, mostly in the agriculture/traditional sectors, receive minimal benefits from growth in absolute terms and their share of aggregate income falls (relative inequality increases). Thus, the initial growth of the modern sectors increases inequality; but continuous structural change leads to modernisation and growth of the agricultural sector leading to a reduced gap in income shares. Growth in the modern sectors is also associated with within-sector inequality due to disparities in demand and income gaps (Fields, 1979). This means in the first and subsequent stages of structural change, growth in the modern sectors increase Y_i ; however, shares of Y_i across $Y_1, Y_2, Y_3 \dots Y_n$ is disproportionate, leading to increased relative inequality.

This study uses the income inequality data from the World Inequality Database comprising four income classes. Based on data availability on the income shares, the bottom 50%, the middle 40%, the top 10%, and the top 1% of the population are used. An individual in the top 1% share has an income greater than 99% of the population. Those in the top 10% have income greater than 90% of the population but less than those in the top 1%. The income classes are used as the dependent variables for estimating Equation 4.

The relationship between inequality and economic growth involves interconnections of several variables and possible lag effects, which a dynamic model could best capture. Keele and Kelly (2006) argue that despite the estimation difficulties associated with models with lagged dependent variables, controlling for a lagged dependent variable remains the appropriate specification for empirical dynamic analysis. Thus, the model of income inequality and economic growth is specified as:

$$Inq_{it} = \beta_1 Inq_{it-i} + \beta_2 IInq_{it} + \beta_3 logy_{it} + \beta_4 logy_{it}^2 + \beta_5 \log S_{it} + \beta_6 logS_{it} \cdot logy_{it} + \beta_7 W_{it} + \pi_i + \delta_t + \mu_{it}$$

(5)

where Inq_{it} is income inequality, measured by the Gini index and y_{it} is the per capita income level. $IInq_{it}$ is the initial inequality measured by the inequality of the first period in

the sample. Countries generally show varying dimensions of inequality. These dynamics may be rooted in the structural heterogeneities of countries, including initial conditions. Inequalities are also influenced by factors such as institutional development and access to social services. Therefore, even for countries with similar conditions of inequality, structural heterogeneity and growth dynamics could still determine long-term trends. Isolating the effect of initial inequality levels would demonstrate the varying dynamics of income inequality in the countries. For example, do countries with similar initial levels of income inequality necessarily follow similar inequality trends? Initial conditions are also important to measure the so-called convergence hypothesis. For instance, are sub-Saharan African countries converging towards a common path of inequality? Do countries with initially high levels of inequality *Inq*_{it-i} measures the persistence of inequality over the period.

 S_{it} is the sectoral shares of total employment which control for the effects of structural change as it captures the reallocation of labour across agriculture and non-agriculture sectors over time. For instance, increased sectoral labour reallocation and productivity can spur growth in low-productive sectors, increase the income share of the poor, and help reduce income inequality in rural areas (Adesina, 2017). S_{it} . y_{it} is an interaction between sectoral labour share and the level of per capita income. The growth of aggregate income is a key factor in the reallocation of sectoral labour shares (Herrendorf et al., 2013, 2015a) and could serve as a moderator of the effect of structural change on inequality. W_{it} is a set of control variables that include net inflows of FDI, imports and exports, and governance. Net FDI, imports, and exports control for the effect of openness. For instance, the inflow of net FDI could influence the capital allocation and investment decisions of firms, this could influence employment shares and income distribution across sectors. Empirical studies have demonstrated varying relationships between income inequality and FDI (Bhandari, 2007; Lee et al., 2022; Ravinthirakumaran & Navaratnam, 2018; Tsai, 1995). The UNDP reports that one of the factors influencing inequality in Africa is the inflow of FDI into the extractive sectors and the surge in trade, especially in resource-rich countries. The World Bank maintains a dataset of key governance measures: government effectiveness, control of corruption, regulatory quality, voice and accountability, political stability and absence of violence/terrorism, regulatory quality, and rule of law based on Kaufmann et al. (2010). To avoid multicollinearity, we derived a composite index of governance using principal component analysis. The inclusion of the governance index controls for the political dimensions of the Kuznets hypothesis. Bhattacharya et al. (2016) argue that the rise in income in developing countries could be associated with high demand for quality public services, which could induce the upper class to form their club of quality public service provisions. This lowers the quality of public services available to others outside the class, good institutions lower this tendency. π_i and δ_t are country and year effects, respectively.

Estimation strategy

This study uses the iterated generalised method of moments (GMM) estimators which have become popular for estimating dynamic panels. The GMM estimations based on linear moment conditions (Arellano & Bover, 1995) and nonlinear moment conditions

(Ahn & Schmidt, 1995) maybe valuable for estimating persistent variables (Fritsch et al., 2021). The GMM estimation in this paper is based on the Iterated GMM estimation based on nonlinear moment conditions. Unlike the conventional GMM which yields biased estimates in the presence of moment misspecification, the iterated GMM allows for mild misspecification error and produces robust estimates (Hansen & Lee, 2021). The Sargan test for overidentifying restrictions is used for validity checks. A detailed description of the iterated GMM can be found in Hansen and Lee (2021).

Data

The study covers 40 SSA countries over the period 2001–2015. The inclusion of countries and periods covered is based on the availability of the data on the inequality measures. The Gini coefficient is the most notable measure of inequality and is used in most empirical analyses. The Gini index ranges between 0 and 1. 0 corresponds to perfect income equality, while 1 corresponds to perfect income inequality. However, the Gini coefficient could be sensitive to substantial changes in income distribution, especially in the upper-income tail (Gastwirth, 2017). Data for the Gini indices are sourced from the Standardized World Income Inequality Database (SWIID) (Solt, 2016, 2020). The SWIID has increasingly become a more reliable and preferred source of data for income inequality analysis, especially for countries without consistent data for household consumption or income shares. For instance, the SWIID has been used in similar studies such as Engler and Weisstanner (2020) and Palma (2019). The SWIID contains two main Gini indices of income inequality and offers the most comprehensive and consistent data in terms of broad coverage of countries and time. The first Gini index is based on disposal/post-tax income - estimates of the Gini index of inequality in equivalized household disposable (post-tax, post-transfer) income. The second Gini index is based on pre-tax income – an estimate of the Gini index of inequality in equivalized household market (pre-tax, pretransfer) income. This study uses both indices to explore inequality across post and pretax incomes. The data for income shares is obtained from the World Inequality Database (WID). The effect of growth on inequality is measured by the level of per capita income in 2015 USD (to assess the Kuznets hypothesis) and obtained from the United Nations database of main economic aggregates. The data for exports and imports are also from the UN database. Data for sectoral shares of labour is based on the ILO-modelled estimated total employment and is obtained from the ILO database. Net FDI is measured as a percentage of GDP and obtained from the World Bank Development Indicators database. The data on governance is obtained from the World Bank's World Governance Indicators database¹ (Kaufmann et al., 2010).

Patterns of income inequality in SSA

Figures 1 and 2 show that the distribution of income shares and the difference in the income shares of the countries vary significantly. This means that despite having similar Gini indices or minor differences in the Gini index, there could still be significant variations in the actual income shares and intra-class inequalities.

Figures 3 and 4 show the 2001, 2010, and 2015 Gini indices and the average Gini index over 2001–15. Both Gini indices (based on disposable income and pre-tax income) are



Figure 1. Distribution of income shares in sub-Saharan Africa. Source: Authors' construction based on data from the WIID.













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relatively high in the southern African countries – South Africa, Botswana, Namibia, and Zambia. These countries also exhibit a low decline in inequality levels. In all the countries, there is no substantial difference between the inequality levels (2001, 2010, 2015, or average 2001–15).

Results

The estimation results focus on three main areas: the Kuznets hypothesis, the persistence of inequality, and the role of structural change. Table 1 reveals that the coefficients of the log of per capita income and lagged log of per capita income are positive and statistically significant, suggesting that growth of aggregate income is associated with increased income shares of the top 1%, 10%, middle 40% and bottom 50% of the population. The coefficients of squared per capita income are also positive and statistically significant,

	(1)	(2)	(3)	(4)
	Top 1% share -	Top 10% share -	Middle 40% share	Bottom 50% share
	Pre-tax	Pre-tax	- Pre-tax	- pre-tax
Log of per capita income	1.653***	3.266***	2.558***	4.856***
5 1 1	(4.94e-04)	(0.002)	(0.006)	(0.001)
Log of per capita income $(t-1)$	0.901***	1.981***	2.307***	4.714***
5 1 1 ((1)	(0.001)	(0.004)	(0.004)	(7.28e-04)
Squared per capita income	0.706***	2.223***	0.761***	2.121***
	(4.15e-04)	(0.003)	(0.006)	(0.001)
Top 1% share - Pre-tax (t-1)	0.434	. ,	. ,	, , ,
(c 1)	(0.548)			
Top 10% share - Pre-tax (t-1)		0.923		
		(0.681)		
Middle 40% share - Pre-tax (t-1)			0.475	
			(1.232)	
Bottom 50% share - Pre-tax (t-1)				1.112*
				(0.661)
Log of employment in agriculture	-0.624***	-0.294***	-1.463***	-2.214***
	(3.18e-04)	(0.002)	(0.004)	(0.001)
Log of employment in industry	1.001***	1.852***	2.027***	3.835***
	(0.002)	(0.005)	(0.002)	(5.13e-04)
Log of employment in services	1.373***	2.931***	2.424***	4.833***
	(0.001)	(0.003)	(0.005)	(0.001)
Log of employment in agriculture \times Log of	0.484***	1.679***	1.759***	4.135***
per capita income	(0.002)	(0.005)	(0.003)	(7.10e-04)
Log of employment in industry $ imes$ Log of	-0.551***	0.483***	-1.282***	-0.887***
per capita income	(0.005)	(0.008)	(0.002)	(8.87e-04)
Log of employment in services $ imes$ Log of	-4.929***	-9.905***	-9.937***	-0.199***
per capita income	(0.002)	(0.003)	(0.007)	(0.002)
Log of exports	-1.517***	-1.157***	-2.970***	-3.766***
	(0.003)	(0.006)	(0.002)	(6.88e-04)
Log of imports	-2.719***	-3.199***	-5.580***	-9.210***
	(0.002)	(0.005)	(0.004)	(8.67–04)
Foreign direct investment	0.714***	1.207***	0.612***	0.687***
	(0.001)	(0.001)	(0.005)	(8.86e-04)
Governance	2.293***	-1.617***	6.235***	6.861***
	(0.003)	(0.005)	(0.005)	(0.001)
Number of countries	40	40	40	40
J-Test (overid restrictions) p-value	0.986	0.238	0.318	0.815
2nd order autocorrelation p-value	0.512	0.956	0.569	0.710
Time Effect	Yes	Yes	Yes	Yes

Table 1. Effect of economic growth on income shares – iterated GMM estimation.

Standard errors in parentheses. ***p < 0.01, **p < 0.05, *p < 0.1.

indicating that all the income shares could continue to increase with the growth in aggregate income. These results appear to contrast the Kuznets hypothesis as there is no indication of turning points where the income shares of the bottom 50% and middle 40% of the population could continue to increase, while the shares of income of the upper-income class (top 1% and top 10%) decline. Perhaps, a glimpse of this turning point could be that the income shares of the bottom 50% appear to increase faster with the growth of aggregate income compared to other income classes. However, this is not significant enough to substantially influence income distribution and the dynamics of inequality. Indeed, the income shares of the top 10% of the population appear to rise faster than the shares of the middle 40%. This suggests little changes in the proportional distribution of income across the upper- and lower-income classes, and thus little effect on inequality. The results indicate that the economies are at the early stages of structural change where income growth is associated with increasing inequality levels. This is consistent with the findings of Batuo et al. (2022) which also show that income shares have remained relatively stable in most African countries.

The results in Table 2 are also not consistent with the Kuznets hypothesis. Growth in per capita income is associated with a decrease in the Gini coefficient. The coefficients of the contemporaneous and lagged per capita income are jointly used to analyse the longrun effect of income growth on inequality. Although the contemporaneous effect on inequality is negative, this could be short-lived given that the lagged effect is positive. Also, the coefficient of the squared per capita income is positive which means a continuous increase in aggregate income could be associated with an increasing level of inequality. Thus, there could be a U-shaped rather than an inverted U-shaped relationship between aggregate growth and inequality in SSA. Suffice to note that the relationship between inequality and income growth is dynamic and could continue to evolve with increasing growth and changes in redistribution policies.

The results also reveal the persistence and non-convergence of income inequality in SSA. The coefficients of the lagged dependent variables are positive and statistically significant. The coefficients of the initial level of inequality are also positive indicating no convergence of income inequality across countries. This suggests that there could be widening inequality across SSA countries, underpinned by rising and persistent inequality within countries rather than differences in income levels or aggregate growth. These results are consistent with the findings of Chancel et al. (2019), who also demonstrate high and persistent income inequality levels in African countries.

Inequality has remained high because the share of income of the lower-income classes along the growth process is disproportionately lower, indicating structural change and income distribution appear to favour the upper-income classes. This also highlights that the income distribution system favours the formal sectors (usually industry and services) whose relative income shares may have risen with economic growth relative to those in the informal and primary sectors. Redistribution policies in SSA may also be in favour of the upper-income classes. For instance, Voto and Ngepah (2023) find that personal income tax and fiscal redistribution systems are positively correlated with income inequality. Poor governance and corruption in Africa could be part of the reasons for the relatively high inequality in the region. For instance, welfare systems are often underfunded in the budget and highly dependent on donor support. It also requires substantial commitment from the political class and an effective governance system.

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	(1)	(2)
	Gini index (disposable	Gini index (pre-tax
	income)	income)
Gini index (disposable income) $(t,1)$	0.653*	
	(0.339)	
Initial Gini index (disposable income)	0.686***	
	(0.035)	
Gini index (pre-tax income) (t-1)		1.027***
		(0.266)
Initial Gini index (pre-tax income)		0.647***
		(0.021)
Log of per capita income	-0.648***	-0.691***
	(0.040)	(0.025)
Lag of per capita income	0.467***	0.454***
	(0.035)	(0.022)
Squared per capita income	0.093**	0.064***
	(0.035)	(0.021)
Log of employment in agriculture	-0.085***	-0.115***
	(0.023)	(0.014)
Log of employment in industry	0.306***	0.290***
	(0.031)	(0.019)
Log of employment in services	-0.888***	-0.917***
	(0.029)	(0.018)
Log of employment in agriculture $ imes$ Log of per capita	0.120***	0.074***
income	(0.036)	(0.023)
Log of employment in industry $ imes$ Log of per capita income	0.234***	0.198***
	(0.032)	(0.020)
Log of employment in services \times Log of per capita income	-0.226***	-0.249***
	(0.026)	(0.016)
Log of export	0.269***	0.244***
	(0.031)	(0.019)
Log of import	0.652***	0.588***
Franking diverse increases	(0.046)	(0.028)
Foreign direct investment	-0.652^^^	-0.671
Causeman	(0.030)	(0.018)
Governance	-0.265****	-0.292****
Number of countries	(0.0325	(0.021)
Number of couldines	20	20
2 nd order autocorrelation	0.775	0.000
Z Older autocorrelation	0.027 Voc	0.925 Voc
	162	165

Table 2.	Economic	growth,	structural	transformation	and	income	inequality	_	iterated	GMM
estimatio	on.									

Standard errors in parentheses. ***p < 0.01, **p < 0.05, *p < 0.1. The number of observations was reduced to 20 due to limited data on the Gini index. Only countries with available data on the Gini coefficient are included.

Thus, inequality might remain persistent as long as the wealth distribution system continues to be path-dependent. Most SSA countries require radical changes in welfare funding, and governance systems to exact substantial changes in wealth distribution and reduce inequality levels. For instance, most countries in the Southern African Customs Union (SACU) have undertaken some of the largest redistribution and welfare programs, yet they remain highly unequal (Sulla et al., 2022).

Structural change is often defined as the change in sectoral shares of labour as aggregate income levels increase. Growth in per capita income is a key factor in analyzing structural change (Herrendorf et al., 2013, 2015b; Rodrik, 2015). Thus, the effect of structural change on income inequality could be influenced by the growth of aggregate income. Increasing income level is assumed to be associated with

a declining share of labour in agriculture and increased labour shares in nonagriculture sectors (industry and services). Consistent with the Kuznets hypothesis, the estimates in Table 1 suggest that increasing the share of labour in agriculture is associated with declining income shares, especially for the bottom 50%. Conversely, increased shares of labour in the non-agriculture sectors increase aggregate income. However, the signs of the coefficient change when the sectoral labour shares are interacted with per capita income. Thus, the effect of sectoral shares on income shares depends on the level of aggregate growth. The coefficients of the interaction terms suggest that structural change may be generally growth-reducing for income shares, less so for the bottom 50%.

In terms of the Kuznets hypothesis and structural change, the results are mixed. The net effect shows that the bottom 50% gains from structural change. However, the top 10% also gains relative to the middle 40% of the population, suggesting an increase in inequality levels. In Table 2, increased labour share in agriculture is associated with declining inequality levels but the effect changes if we control for per capita income as a moderating variable. Generally, increased shares of labour in industry are also associated with increased inequality, while increased shares of labour in services reduce inequality levels.

The key lesson from these results is that African countries are still at the early stages of structural transformation where the declining shares of labour shares in agriculture have not reflected significantly in the growth of income of the poor and therefore have minimal effect on inequality levels. These are features of countries at the early stages of structural change where structural change could be growth-reducing (Rodrik, 2015). In the last few decades, most African countries have experienced increased shares of labour in services. This may have contributed to some decline in inequality levels, but this appears to have little impact on the overall inequality levels.

Regarding the control variables, the results in Table 1 show that increased FDI inflows and improved governance may be associated with increased income shares of the bottom 50% and reduced inequality levels. Although both imports and exports are negatively related to income shares, the middle 40% and bottom 50% could experience more declining income share with increased trade, especially with increased imports. This is consistent with the results in Table 2 where increased export and import could be associated with increased Gini Coefficient.

Finally, in Table 2, the results are similar in terms of whether inequality levels are measured before or after tax. This suggests that redistribution systems in SSA countries may be inefficient or have less influence on income distribution. It could be argued that tax-based redistribution systems may be weak in the region. Although average income tax levels in most African countries are progressive, they average around 9% which is low compared to developed countries (Batuo et al., 2022; Granger et al., 2023). Top earners pay less compared to those in advanced economies. Wage inequality continues to rise. Wage distribution is positively skewed towards the formal sectors which employ a small share of the population. For instance, the political classes are often highly paid relative to other workers (Odusola, 2016). Also, the upper-income class owns significant shares of wealth in assets. Thus, SSA countries can reduce wealth and income inequality by increasing the progressivity of the tax regimes. They could implement progressive net

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wealth tax systems where individuals with high net wealth pay high taxes. Currently, most countries in SSA have no such taxes (Mbalati, 2023).

Most SSA countries have implemented varying redistributive policies over the years, some of which have helped reduce inequality across the top 10% and bottom 50% income shares. For instance, Ghana has implemented social intervention policies such as health insurance, free maternity care, school feeding, free basic and secondary education, and social transfers. Other countries like Ethiopia and Senegal have also implemented policies to increase access to health and education and reduce poverty levels. Burkina Faso, Mali, Nigeria, and Zambia have adopted minimum wage policies and other labour reforms that have helped reduce inequality levels (Berhane, 2023; Rougeaux, 2017; World Bank, 2016). However, these redistributive policies appear inadequate to substantially narrow inequality levels because the coverage is low and often inefficient. There are also heterogeneities in the impact of social safety nets in terms of target groups and sectors. A more coordinated social program could enhance the efficiency of such a program in reducing inequality (Ralston et al., 2017).

Robustness checks

The study undertakes some robustness checks of the results. Firstly, the baseline estimations have already controlled for endogeneity by using the iterated GMM estimation bias. Secondly, there is a tendency for the relationship between inequality and growth and/or structural change to be dynamic rather than contemporaneous. To control for this, the lag of the regressors was included in the estimation. The results (available on request due to word count limitation) suggest that lagging the independent variables does not substantially change the estimates as compared to the baseline results in Table 2. Further, the one-step and two-step GMM estimators were employed to check the consistency of the estimates. The results (also available on request) largely mirror the baseline results in Table 2. This suggests that the results are robust.

Conclusion

This study analysed the dynamics of income inequality across SSA countries by examining the role of income growth and structural change. The results confirm two notable stylised facts about inequality and economic growth in SSA: (1) inequality levels are higher and very persistent, and (2) inequality levels across countries are underpinned by substantial inequality within countries. Indeed, inequality within countries appears more pronounced.

Although income growth widens inequality in the region, structural change, especially the transition of the economies towards the services sectors via the reallocation of labour from the agricultural and industry to the services sector, could help reduce income inequality in SSA. Structural change has contributed little to reducing inequality levels because some SSA countries have experienced growth-reducing or growth-neutral structural change. Labour has not been efficiently allocated to growing sectors. Thus, the Kuznets hypothesis does not appear to apply to SSA countries. This could be a reflection of the early stages of structural transformation where the declining shares of labour in agriculture and

informal sectors are not substantial enough to increase the income of the poor. The labour leaving agriculture could also end up in less productive nonagriculture sub-sectors. Thus, income growth is not associated with declining inequality levels. All of these suggest that economic growth may not have benefited the poor substantially enough (scale and/or magnitude) to reduce inequality levels in the region.

These findings underscore the importance of pro-poor growth policies in the SSA countries to achieve growth processes that can reduce inequality levels (Bird & Busse, 2006a; United Nations Research Institute for Social Development (OECD, 2018; UNRISD, 2017). Policies for macroeconomic stability and economic growth require the incorporation of income redistribution measures to ensure inclusive growth. This is more relevant given that the Kuznets hypothesis may be inapplicable to the region, hence the prospects for automatic inequality reduction as income grows seem farfetched. The study used pre-tax income shares ratios which showed substantial inequalities. This is evident that progressive income taxes could be effective in reducing income inequality. With the knowledge of the gaps in pretax income shares, governments could reduce inequalities in disposable incomes by increasing taxes on the top income classes and increasing pro-poor policies that enhance productivity at the lower income levels. In doing this, governments may increase both the tax compliance and tax nets of the top-income classes while exempting the lower-income classes from certain taxes. The entrenchment of a more targeted direct income transfer system combined with a progressive tax system could narrow income gaps. Direct income transfers could provide the basic income for the poor and help reduce inequality (Coady & Le, 2020). However, such policies should be implemented carefully to avoid a reduction in aggregate production efficiency. Dabla-Norris et al. (2015) argue that tax and income transfer systems could be positive for economic growth and could be negative only in extreme cases. Such redistributive policies could enhance the opportunities of the poor and reduce possible future widening inequalities. Policymakers could also consider other redistributive policies with relatively lower budgetary costs such as an increase in the minimum wage. This could increase the income shares of those at the bottom of the income ladder as they are most affected by minimum wage changes.

Further, considering the effect of structural change, policymakers could enhance the further transition of labour to more productive non-agriculture sub-sectors. This could be achieved via greater opportunities for labour mobility and training. In addition, given that large shares of labour in SSA are in the agricultural sector, the countries need to pursue policies that could enhance the development of the sector. This could improve the productive efficiency of the sector and, by extension, increase labour income shares.

Note

1 2001 data for the governance indices are not available. We imputed this missing data with the average of 2000 and 2002 data (see. A composite governance variable is created using principal component analysis.

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