Volume 41, Issue 3

The Income Redistributive Effects of Taxes in Africa

Mark Edem Kunawotor
University of Professional Studies, Accra

Charles Barnor
University of Professional Studies, Accra

Raymond Dziwornu
University of Professional Studies, Accra

Abstract

This paper investigates the role taxation plays in income redistribution in Africa. We focus on 52 African countries over the period 1990 - 2017 and deploy the robust system Generalized Method of Moments estimation strategy. Our findings indicate that taxes play a statistically significant role in narrowing income inequality in Africa. In particular, direct tax in the form of taxes on income, profit and capital gains plays a much stronger role in income redistribution than other forms of taxes. Contrary to our expectations, we find property taxes to have an income un-equalizing effect and this may be due to the low property tax base and weak tax compliance levels in Africa. Similarly but unsurprisingly, we find taxes on goods and services, value-added tax and taxes on international trade and transaction to be regressive in Africa. The paper suggests a broadening of the tax net in Africa with more attention towards taxes on income, profits and capital gains in order to ensure a fair balance between equality and efficiency. Efforts towards the collection of property taxes should also be boosted.

1. Introduction & Literature

Income inequality has declined globally in the past three decades (Lakner & Milanovic, 2015). Nonetheless, income inequality in Africa declined only marginally and has remained relatively high and persistent (see Kunawotor et al., 2021; Asongu et al., 2020; Kunawotor et al., 2020; Shimeles & Nabassaga, 2018). African countries have only outperformed countries in Latin America and the Caribbean in the global income inequality distribution (UNDESA, 2019; World Bank, 2016; IMF, 2014). Policymakers and governments have raised concerns about the high and persistent nature of income inequality due to the deleterious effects on the attainment of the Sustainable Development Goals (Asongu, 2020; Anyanwu, 2016). High levels of income inequality have detrimental implications for economic growth and sustainability (IMF, 2014; Ncube, Anyanwu & Hausken, 2014; Ostry, Berg & Tsangarides, 2014; Berg & Ostry, 2011). It also hampers the rate at which economic growth reduces poverty (Ravallion, 2004), impairs social cohesion and makes it difficult to secure public support for growth-enhancing reforms (Gupta, 2018). This ties in with the fact that majority of the world's poor live in Africa (Sala-I-Martin, 2006). The focus of this present study is to empirically examine the effectiveness of tax variants as policy tools in addressing income inequality in Africa. This focus is premised on the argument that fiscal policy in the form of taxes and government spending is considered to be the most potent tool used by governments in addressing income inequality in the short and long run (Gupta, 2018; IMF, 2015).

Taxes and transfers aid in transferring resources from high-income households to low-income ones. In particular, Cevik and Correa (2015) assert that taxation plays a key role in attaining equitable income distribution not only through its progressivity but also by generating sufficient revenue to fund government spending on social programs. IMF (2014) also argues that personal income taxes are preferred in income redistribution than consumption taxes because they directly take account of households' ability to pay. Fiscal policy tools have however been argued to be ineffective in redistributing incomes in developing countries (Gupta, 2018; IMF 2014; 2015). In this line of thought, Nantob (2016) avers that the tax system in developing countries have had less redistributive impacts for several reasons. First, wealth and income taxes contribute less to the overall tax structure of developing countries. Secondly, taxes on income seems to dominate capital gains taxes and corporate taxes due to the limitations in tax laws and this exempts a lot of wealthy people from paying tax. Third, it may be politically difficult and inexpedient. Nevertheless, there exists a limited number of empirical studies to reinforce or refute the above assertion in the African context. This study consequently fills this void in the empirical literature by examining the effects of taxes on income inequality in Africa.

A number of income inequality studies essentially focused on the determinants of income inequality (Anyanwu et al. 2016; Anyanwu, 2016; Dabla-Norris et al., 2015) or income inequality and economic development with an attempt to confirm the Kuznets hypothesis (Lee et al., 2013; Dincer & Gunalp, 2012). Some other recent studies focus on institutions with particular attention to gauge the nexus between corruption and income inequality (Kunawotor et al., 2020; Sulemana & Kpienbaareh, 2018; Dwiputri et al., 2018; Adeleye et al., 2017; Batabyal & Chowdhury, 2015). Yet still, few others such as Asongu et al. (2020); Asongu et al. (2019) focus on finance or information technology, inequality, and inclusive education in Africa. The identifiable studies that focus on the link between fiscal policy (taxation) and income inequality include Salotti and

Trecroci (2018); Odusola (2017); Nantob (2016); Cevik and Correa-Caro (2015); Muinelo-Gallo and Roca-Sagalés (2013). These studies are, however, primarily centered on advanced economies or developing economies in general. Odusola (2017) focused entirely on Africa but does not provide econometric evidence and does not focus on taxation. Our study contributes to the extant literature on several fronts. First, we provide new empirical evidence with updated data spanning a much longer period, 1990 – 2017. Second, we use a comprehensive variant of taxation indicators. Third, our paper provides econometric evidence, unlike studies that provide economic narratives. Fourth, we deploy a dynamic empirical model and use the robust system Generalized Method of Moment (GMM) to take care of the persistent nature of income inequality.

The empirical literature on taxation and income inequality includes the paper by Salotti and Trecroci (2018) using panel data of OECD countries over the 40-year period, 1970 – 2010. Their findings show that payroll tax, income tax and total tax are negatively and significantly associated with income inequality while taxes on goods and services have a positive and statistically significant effect on income inequality. Cevik and Correa (2015) in a similar fashion investigated the redistributive contribution of fiscal policy in China and a panel of BRIC countries over the period 1980 – 2013. The findings from their study show that government spending worsens income distribution while taxation appears to improve it.

The few available studies on taxation or fiscal policy and income inequality that principally focused on African countries are studies by Odusola (2017), Nantob (2016) and Inchauste et al., (2015). The study by Nantob (2016) investigates the relationship between taxation and income inequality in 46 developing countries including some African countries over the period 2000 – 2012. The study found a negative relationship between tax revenue and income inequality but found a positive relationship between taxes on goods and services, taxes on income, profits and capital gains and taxes on international trade on one hand and income inequality on the other hand. Odusola (2017) on the other hand provides a narrative on the role fiscal policy plays in reducing poverty and income inequality in Africa. The paper concludes that fiscal policy instruments such as taxes, transfers and spending play very crucial roles in reducing inequality and poverty and therefore calls for improvement in progressive taxation in countries with high fiscal space and high levels of income inequality. Inchauste et al. (2015) study on the distributional impact of fiscal policy but with a focus on South Africa. They find that the burden of taxes such as personal income tax, value-added tax, excise taxes on alcohol and tobacco, and fuel levy is borne more by the rich. The rest of the paper is organized as follows; methodology follows this section, then results and discussion and then ends with conclusion and policy recommendations.

2. Method and Data

2.1. Empirical Model

This study deploys a dynamic model by following similar approaches used in recent inequality-centric studies (see Kunawotor et al., 2020; Adeleye et al., 2017; Anyanwu et al., 2016; Nantob, 2016; Anyanwu, 2016). Our model however, differs slightly by the inclusion of variants of tax indices as explanatory variables. Our specified model, therefore, regresses the net Gini income inequality coefficient on its first-period lag, taxes and a vector of control variables;

$$IncInequality_{i,t} = \alpha IncInequality_{i,t-1} + \omega Taxes_{i,t} + \beta' X_{i,t} + \eta_i + \lambda_t + \varepsilon_{i,t} \ ..... (1)$$

$IncInequality_{i,t}$ represents income inequality and $IncInequality_{i,t-1}$ represents the first period lag of income inequality in a given country (i) and year (t). Taxes represent variants of tax indicators

including total taxes, total direct taxes, total indirect taxes, property taxes, taxes on goods and services, value-added tax, taxes on international trade and taxes on income, profits and capital gains. X_{it} represents a vector of control variables that are often included in income inequality studies. These include real GDP per capita, political globalization, democracy, unemployment, trade openness, natural resource rent, population growth, gross capital formation, school enrollment, dependency ratio and foreign direct investment. η_i is the unobserved country-specific effect while λ_t is the time effect. $\varepsilon_{i,t}$ represents the idiosyncratic error term. The definitions and measurements of the variables used in this study are presented in the next section along with the sources of data.

2.2. Measurements of variables & Sources of data
Table 1: Measurements of variables & Data sources

Variables	Variables definitions & measurement	Data source
Income Inequality	Income inequality is measured by net Gini (post-tax, post-transfer income). It ranges from 0 - 100, where 0 represents perfect equality while 100 represents perfect inequality.	Standardized World Income Inequality Database (SWIID)
Total Tax	Total tax revenue is expressed as a percentage of GDP and include all direct taxes, indirect taxes and social contributions.	International Centre for Tax and Development (ICTD) & UNU-WIDER government revenue dataset.
Direct Tax	Direct tax include non-resource taxes on income, profits and capital gains. It also include taxes on payroll and workforce, and taxes on property.	ICTD & UNU-WIDER government revenue dataset.
Indirect Tax	Indirect tax captures taxes on goods and services, taxes on international trade and other taxes.	ICTD & UNU-WIDER government revenue dataset.
Taxes on goods & services	Taxes on goods and services include sales taxes and excise taxes.	ICTD & UNU-WIDER government revenue dataset.
Taxes on international trade and transactions	Taxes on international trade and transactions include both import and export taxes.	ICTD & UNU-WIDER government revenue dataset.
Real GDP per capita	Real GDP per capita is measured as the natural log of constant gross domestic product per capita (GDP).	World Development

		Indicators @ World Bank
Trade openness	It captures the extent of trade liberalization in a country and it is measured as the sum of total exports and imports as a percentage of GDP.	World Development Indicators
Natural resource rent	It is the extent of reliance on natural resources in a country and it is measured as total natural resources rent as a percentage of GDP.	World Development Indicators
Political globalization	It is measured by KOF's indices of globalization and comprise the absolute number of embassies in a country, personnel contributed to UN Security Council missions (% of the population), number of internationally oriented non-governmental organisations operating in a country, number of international inter-governmental organisation in which a country is a member, international treaties signed and number of distinct treaty partners of a country with bilateral investment treaties.	KOF (2019)
Democracy	This is measured by the polity 2 index and ranges from -10 (autocracy) to 10 (democracy).	Marshall's Polity IV Project
Age dependency ratio	It is computed as the sum of young age population and old age population as a ratio of the working age population.	World Development Indicators
Foreign direct investment (FDI)	FDI is measured as net inflows of foreign direct investment to GDP.	World Development Indicators
Gross capital formation	It is defined as the extent of usage of physical capital in production and measured as gross capital formation to GDP.	World Development Indicators
Population growth	It is measured as the annual percentage growth in population.	World Development Indicators
School enrollment	It is measured as the gross secondary school enrollment rate in a country.	World Development Indicators
Unemployment	This is measured as total unemployed as a percentage of the total labour force.	World Development Indicators

Source: Authors construct (2021)

2.3. Scope of the study and Estimation technique

This study includes annual panel data of 52 African countries covering the period 1990 – 2017. The constraint however, in the number of countries in the results is largely due to data unavailability in some countries. This study employs the dynamic two-step system Generalized Method of Moments (GMM) estimation approach with robust standard errors. The choice of the system GMM as the empirical strategy is motivated by five reasons in line with recent GMM-centric literature (Kunawotor et al., 2021; Kunawotor et al., 2020; Asongu et al., 2020; Tchamyou

et al., 2019; Agoba et al., 2019; Fosu & Abass, 2019). (i) The number of cross-sections (N) is higher than the time per cross-section (T). i.e. while the number of countries is 52, the sampled period is 28 years. (ii) The dataset is panel in nature and the empirical strategy accounts for cross country differences in the estimation process. (iii) GMM is tailored to address endogeneity concerns in two ways; first, it controls for unobserved heterogeneity by accounting for time-invariant omitted variables. Secondly, GMM generates internal instruments that account for simultaneity bias or reverse causality. (iv) Several empirical studies have found income inequality to be persistent (see Asongu et al., 2020; Kunawotor et al., 2020; Salotti & Trecroci, 2018; Shimeles & Nabassaga, 2018; Adeleye et al., 2017; Anyanwu, 2016; Cevik & Correa, 2015). This justifies the inclusion of the first period lag of income inequality in the empirical model and consequently the need to use the dynamic system GMM as the estimation technique. Also, the data deployed in our study shows evidence of correlation (0.9993) between income inequality in levels and its first-period lag and this exceeds the threshold of 0.8 established in literature to determine persistence (Asongu et al., 2020; Tchamyou et al., 2019). (v) Finally, GMM is preferred as an estimation strategy because there are general difficulties in finding external instruments. It is worth noting that all the diagnostics tests needed for the robustness of GMM proved satisfactory. In particular, the Hansen test for overidentifying restrictions tests for the validity of the moment conditions and also, the test of the null hypothesis of no second-order serial correlation is performed by the Arellano–Bond test for autocorrelation (AR (2)).

3. Results & Discussion

3.1. Descriptive Statistics

The mean net Gini coefficient for Africa in our sample is 43.34. This is presented in Table 2 and this appears quite high relative to other countries and continents. For example, Salotti and Trecroci (2018) found a mean net Gini of 28.59 for a group of 22 OECD countries. It is evident that the tax effort in Africa is low as shown by the average of 16 percent for total tax. While this figure is similar to the average of 15.58 percent, found in the study by Nantob (2016) for 43 developing countries, it compares unfavourably with counterparts in industrialized OECD countries with a tax to GDP over 34 percent (see Salotti and Trecroci, 2018). In conformity, IMF (2015) argues that the average tax ratio in advanced economies exceeds 30 percent of GDP while those of developing economies ranges between 15 percent and 20 percent of GDP. Indirect tax (9 percent) accounts for a higher fraction of the total tax in Africa than direct tax (6 percent) and this is one of the contributory factors that account for the ineffectiveness of taxes in income redistribution. This may be because most people in Africa work in the informal sector and pay no form of direct tax. Also, few sustainable corporations pay corporate tax and it is difficult to evade indirect tax, unlike the direct tax. In this line of thought, Prasad (2008) argues that developing countries rely more on indirect taxes because of the low tax base due to low-income levels. It is also due to inefficiencies in collecting direct taxes and generally high levels of tax evasion. More importantly, due to the large informal sector activities which generate no direct income tax.

The property tax collection rate in Africa is very low as the rate falls below 1 percent (0.14 percent). This simply means that the fiscal space in these countries can be broadened by including more people in the property tax net. In conformity with this, Gupta (2018) affirms that while OECD countries on average generate 2 percent of GDP in property taxes, developing countries get less than half percent of GDP. The mean Gini coefficient of 53.22 is highest in Southern Africa compared to 41.24 in East Africa and 41.05 in West Africa. However, Southern African countries

have the highest tax-to-GDP ratio of 24.08 percent relative to 14.06 percent in East Africa and 13.04 percent in West Africa. This means that countries with high Gini coefficients have high tax efforts.

Table 2: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Net Gini	986	43.344	7.099	30.2	62.4
Total taxes	565	15.958	8.532	.573	55.698
Direct tax	578	6.166	4.005	.199	18.846
Taxes on income	587	4.77	3.116	.195	16.187
Property tax	556	.139	.276	0	1.469
Indirect tax	639	8.895	6.142	0	45.834
Taxes on goods	548	1.316	1.096	0	6.367
VAT	553	3.755	2.524	0	12.172
Taxes on trade	613	3.097	4.825	0	37.842
GDP per capita	1390	2211.006	2926.692	164.337	20512.941
Globalization	1453	53.602	17.936	8.21	92.148
Polity2	1345	.616	5.658	-10	10
Trade open	1251	.693	.35	.191	3.762
FDI	1388	4.036	9.132	-8.589	161.824
Age dependency	1450	84.509	15.633	41.293	112.849
Population growth	1450	2.379	1.085	-6.766	8.118
Enrollment rate	862	41.225	25.644	5.221	115.957
Unemployment	1377	9.299	7.593	.285	37.94
Capital formation	1293	21.575	9.888	-2.424	85.101
Resource rent	1423	12.263	12.336	0	84.24

3.2. Discussion

3.2.1. The Effects of Total Tax and Direct Tax on Income Inequality

The result shows that total tax is statistically significant with a negative sign and this is shown in Model 1 in Table 3. That is, total tax revenue which comprises both direct and indirect tax is negatively associated with income inequality. This shows that taxes in general have a significant role to play in narrowing the income inequality gap in Africa although studies suggest that it has not been too effective in bridging the difference between net Gini and market Gini (see Gupta, 2018; Zolt & Bird, 2005).

Direct tax also has a significant impact on income inequality in Africa as shown by the negative and statistically significant association between direct tax and income inequality in Model 2. The impact of direct tax on income inequality appears somewhat statistically stronger (-0.043) than that of total tax (-0.032). Thus, while the elasticity of direct tax is about 4.3, that of total tax is about 3.2. Even stronger is the income inequality-narrowing impact of taxes on income, profit and capital gains with a magnitude of about 8.1 percent. And this is also statistically significant as shown in Model 3. Joumard, Pisu, and Bloch (2012) affirm in their study on OECD countries that personal income tax is the most progressive tax. African countries may need to put more premium on broadening the tax net on incomes (payroll tax and corporate tax) as well as capital gains tax

rather than increasing the tax rates. This can be achieved by taking measures to bring in more citizens and corporate entities. These findings conform to the results of Salotti and Trecroci (2018) who found a negative association between total and income tax on one hand and income inequality on the other among OECD countries. These policy measures will ensure that a fair tradeoff is struck between equality and efficiency since a higher marginal tax rate on income may discourage individuals who earn high income from exerting more efforts.

Property tax which is a form of direct tax has a positive and statistically significant association with income inequality in Model 4 contrary to our expectations. Thus, property tax rather widens the income inequality gap, and this may be explained by the fact that property tax ratio in Africa is very low and it is evidenced in the average collection rate of less than 1 percent. This finding is in line with the arguments made by Gupta (2018) that property tax has low progressivity in developing countries due to weak compliance and narrow tax bases. The paper further argues that the narrow tax base is due to widespread tax exemptions and preferential treatment. The IMF (2014) in a similar fashion argues that property taxes are efficient and equitable but they are rather underutilized in many economies. Hence, there is considerable space to exploit this tax more fully both as a revenue source and a tool for redistribution. It is worth mentioning that there appears to be no non-linear effect of property tax on income inequality when the squared of property tax is introduced in Model 4 (results not shown here).

In terms of the other explanatory variables introduced as controls, we find income inequality increases as an economy develops and thereafter decreases. The point of inflection occurs at $1,998 in Model 4. The population growth rate has a positive sign and it is statistically significant in Model 2 – Model 8. As the population expands, the available resources and income-generating activities become thinly distributed among the populace especially the underprivileged and this tends to widen the income inequality gap. An increase in the secondary school enrollment rate reduces income inequality as it appears statistically significant in Model 7. Generally, higher educational levels are associated with higher incomes and thus tends to narrow the income inequality gap.

Gross capital formation which proxies for the acquisition and usage of physical capital is statistically significant with a negative sign in Model 2, Model 4 & Model 6 - Model 8. This means that the investment into the usage of more physical capital increases productivity and this comes with a corresponding increase in earnings. Similarly, earnings from natural resources in the form of natural resource rent reduce income inequality and this is evident in Model 1 where it appears statistically significant. The exploitation of natural resources in Africa yields fruits by providing a source of livelihood to many and bridging the income inequality gap. Political globalization plays an income-equalizing effect in Africa as it serves as an income-earning and job-creating venture through the activities of embassies and international NGOs in a country. This effect is observable in Model 8 with a negative sign and it is statistically significant as well. While we find no statistically significant effect of democracy, trade openness and FDI inflows on income inequality, age dependency ratio and unemployment contrary to our expectations decrease income inequality.

Table 3: Total Tax & Direct Taxes

VARIABLES	MODEL 1	MODEL 2	MODEL 3	MODEL 4
Net Gini (-1)	1.039***	1.058***	1.061***	1.003***
	(0.023)	(0.020)	(0.024)	(0.019)
Total Tax	**-0.032****	--	--	--
	(0.013)			
Direct Tax	--	**-0.043****	--	--
		(0.021)		
Taxes on Income, Profits & Capital gains	--	--	**-0.081****	--
			(0.038)	
Taxes on Property	--	--	--	**0.270****
				(0.126)
Real GDP per capita	0.266	0.051	0.171	0.912*
	(1.346)	(1.109)	(0.638)	(0.514)
Real GDP per capita – square	-0.030	-0.006	-0.012	-0.060*
	(0.100)	(0.080)	(0.046)	(0.034)
Political globalization	0.005	0.008	0.007	-0.005
	(0.004)	(0.005)	(0.005)	(0.005)
Democracy - polity2	-0.006	-0.008	-0.003	-0.005
	(0.006)	(0.005)	(0.004)	(0.005)
Trade openness	0.274	0.367	0.221	0.145
	(0.317)	(0.265)	(0.162)	(0.225)
FDI	0.000	0.001	0.003	0.004
	(0.005)	(0.005)	(0.005)	(0.005)
Age dependency ratio	-0.020**	-0.018***	-0.016***	-0.004
	(0.007)	(0.005)	(0.005)	(0.003)
Population growth	0.090	0.119**	0.123***	0.099***
	(0.064)	(0.044)	(0.033)	(0.020)
Secondary school enrollment	-0.003	-0.004	-0.001	0.001
	(0.003)	(0.003)	(0.002)	(0.002)
Unemployment	-0.005	-0.024**	-0.015*	-0.010
	(0.013)	(0.011)	(0.008)	(0.012)
Gross capital formation	-0.005	-0.007*	-0.005	-0.015***
	(0.004)	(0.004)	(0.004)	(0.003)
Natural resource rent	-0.007**	-0.002	0.003	-0.003
	(0.003)	(0.004)	(0.004)	(0.003)
Constant	-0.325	-1.412	-2.234	-2.880
	(4.873)	(3.053)	(2.474)	(2.443)
Observations	260	267	265	254
Number of countries	23	24	24	24
Number of instruments	21	21	17	16

AR(1):(Pr > z)	-2.13(0.033)	-2.20(0.028)	-2.12(0.034)	-3.09(0.002)
AR(2):(Pr > z)	-0.56(0.576)	0.64(0.523)	0.14(0.890)	-0.55(0.580)
Sargan test:(Prob > chi2)	1.10(0.982)	0.93(0.988)	0.06(0.969)	0.48(0.487)
Hansen test: (Prob > chi2)	3.32(0.768)	2.86(0.826)	0.29(0.866)	0.24(0.621)

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

3.2.2. The Effects of Indirect Tax on Income Inequality

Our findings reveal that total indirect tax has no statistically significant association with income inequality as apparent in Model 5 in Table 4. However, all the sub-components of total indirect tax appear statistically significant with positive signs as per a priori expectations. Taxes on goods and services appear regressive and statistically significant in Model 6. Thus, sales tax and excise tax which forms part of taxes on goods and services take relatively more taxes away from the less privileged than the more privileged and this tends to widen income inequality. Salotti and Trecroci (2018) similarly found a positive association between taxes on goods and services and income inequality in their sample of 22 OECD countries.

Value Added Tax (VAT) also has a positive and statistically significant association with income inequality in Model 7. Just like the sales and excise taxes, VAT is a form of regressive tax as the poor tend to pay more than the rich and this further widens the income inequality gap between the haves and have nots. The study by IMF (2014) also found VAT and excise duties to be regressive and this affirms our findings. Similarly, taxes on international trade and transactions also appear statistically significant with a positive sign as shown in Model 8. Thus, taxes on international trade and transactions un-equalizes within-country income distribution. Most of these indirect taxes appear regressive because they charge a flat rate on all persons and businesses and this does not ensure vertical or horizontal equity. In line with the results on the progressive impacts of direct taxes and the regressive nature of indirect taxes in Africa, Odusola (2017) asserts that many countries are deepening their direct taxation with some shifting away from indirect tax in order to narrow income inequality.

Table 4: Indirect Taxes

VARIABLES	MODEL 5	MODEL 6	MODEL 7	MODEL 8
Net Gini (-1)	1.067***	1.006***	1.081***	0.994***
	(0.035)	(0.012)	(0.024)	(0.009)
Indirect Tax	**0.013**	--	--	--
	(0.020)			
Taxes on Goods & Services	--	**0.047***	--	--
		(0.023)		
Value Added Tax	--	--	**0.017***	--
			(0.010)	
Taxes on International Trade	--	--	--	**0.016****

				(0.007)
Real GDP per capita	0.717	0.803*	0.583	0.469
	(1.717)	(0.397)	(1.147)	(0.410)
Real GDP per capita – square	-0.046	-0.048*	-0.035	-0.021
	(0.129)	(0.026)	(0.084)	(0.027)
Political globalization	0.005	-0.004	0.005	-0.005*
	(0.008)	(0.003)	(0.005)	(0.003)
Democracy - polity2	-0.002	-0.004	0.007	-0.005
	(0.009)	(0.006)	(0.009)	(0.004)
Trade openness	0.425	0.134	0.612	-0.086
	(0.427)	(0.174)	(0.367)	(0.174)
FDI	0.002	0.006	0.001	0.007
	(0.011)	(0.004)	(0.006)	(0.006)
Age dependency ratio	-0.016**	-0.004	-0.020***	-0.006*
	(0.008)	(0.003)	(0.005)	(0.003)
Population growth	0.124**	0.098***	0.127**	0.115***
	(0.053)	(0.017)	(0.050)	(0.011)
Secondary school enrollment	-0.007	-0.000	-0.011**	-0.001
	(0.005)	(0.003)	(0.005)	(0.002)
Unemployment	-0.046	-0.008	-0.053***	-0.003
	(0.032)	(0.009)	(0.019)	(0.007)
Gross capital formation	-0.010	-0.013***	-0.010*	-0.016***
	(0.007)	(0.003)	(0.005)	(0.003)
Natural resource rent	-0.003	-0.001	-0.003	-0.002
	(0.007)	(0.004)	(0.004)	(0.004)
Constant	-4.384	-2.977*	-4.239	-1.031
	(4.270)	(1.682)	(3.290)	(1.780)
Observations	273	256	260	257
Number of countries	25	24	24	25
Number of instruments	21	20	24	19
AR(1):(Pr > z)	-2.41(0.016)	-3.19(0.001)	-1.53(0.127)	-2.80(0.005)
AR(2):(Pr > z)	0.80(0.422)	-0.31(0.760)	1.56(0.119)	-0.12(0.905)
Sargan test:(Prob > chi2)	3.56(0.735)	8.30(0.140)	3.72(0.929)	1.67(0.796)
Hansen test: (Prob > chi2)	3.75(0.710)	2.59(0.762)	6.00(0.740)	1.44(0.838)

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

4. Conclusion and Policy Implications

Income inequality has been pervasive in Africa over decades and this has been a major hindrance to several socio-economic outcomes such as economic growth, poverty reduction, sustainable development, inclusive education, and social cohesion among others. Fiscal policy tools in the form of taxation and government spending have been proffered to be the best tools to address this canker. However, empirical evidence to back this assertion has been largely deficient in the African context. This study, therefore, in a subtle attempt to fill part of this gap, investigates the effects of taxes on income inequality in Africa.

The results of the study show that the average tax ratio in Africa is very low compared to other continents. Indirect taxes contribute more to the total tax net than direct taxes. However, due to the large informal sector nature of most African economies, indirect taxes are mostly ineffective in ensuring income redistribution. The property tax collection rate in Africa falls below half percent. Our findings reveal that total tax contributes to a narrowing of income inequality. However, the effects of direct taxes and in particular taxes on income, profits and capital gains play a more significant role in income redistribution in Africa than other forms of taxes. We also find property taxes to rather have an income un-equalizing effect. Further, indirect taxes such as taxes on goods and services, value-added tax and taxes on international trade and transactions hinders income redistribution in Africa.

As the empirical evidence provide support that taxes play a very important role in income redistribution in Africa, we suggest that African countries need to strengthen tax administration and broaden the tax base in their respective countries. Raising of direct tax rates should be treated with caution in order to ensure that an effective balance is struck between equality and efficiency as in the case of Diamond-Mirrlees production efficiency theorem. Also, tax administrators may need to enforce more compliance especially with regards to property tax. More premium should also be placed on the collection of payroll tax, corporate tax, and capital gains tax. To ensure an effective income redistribution, indirect taxes, sales and excise taxes should be increased on items that are more consumed by the rich.

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