TAX STRUCTURE AND ECONOMIC GROWTH IN AFRICA

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ABSTRACT

This paper on tax structure and economic growth in Africa considers the effects of taxes, defined broadly as direct taxes and indirect taxes, on the rate of economic growth in 52 African countries for the period 1980 to 2020 using the two-step system generalized method of moments. Results from the analyses show that a higher direct taxes-to-total taxes ratio (DTR), that is, higher direct tax relative to total tax, is associated with lower rates of economic growth. The contrary is true for the indirect taxes-to-total taxes ratio (ITR). The paper concludes that higher direct taxes, as a proportion of total taxes, lead to slower economic growth on the continent, while higher indirect taxes, as a proportion of total taxes, lead to faster economic growth. The policy implication of this finding is that any increase in the direct taxes, without a proportional increase in indirect taxes, will lower the economic growth rate, while the converse is true for indirect taxes. The paper, therefore, recommends that to enhance economic growth, increases in tax rates or the enforcement of tax laws should place greater emphasis on the indirect taxes, while caution should be applied in the design and administration of direct taxes.

Keywords: Taxation; Tax structure; Economic growth; Africa
JEL Classification: E62, H20, H21, H24, H25, H30, O47, O55

INTRODUCTION

Taxation is adjudged to affect the behaviour of economic agents. While direct taxes, such as the progressive income tax, are said to influence participation in labour activities, where steep rises in taxable income result from increased income, and capital taxation alters investment decisions, indirect taxes such as the sales or consumption tax alter consumption behaviours (Diamond & Mirrlees, 1971; Gentry & Hubbard, 2000). Taxes, consequently, alter the level of economic activity, either by directly altering the economic decisions of the active participants in economic activity or indirectly by altering the demand for output (Hall & Jorgenson, 1967; Hassett & Hubbard, 1996; Trostel, 1993).

The tax structure, a combination of public revenue with respect to the different sources of tax and the structural features of these taxes (Hettich & Winer, 1984), has been associated with the level of economic activity. The literature on the relationship

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between tax structure and the level of economic growth has been studied beyond the mere tax-growth nexus, where it is commonly held that taxes impede growth, by querying which among the types of taxes impedes (or enhances) growth and to what extent they do so. Income taxes have been found to inversely affect the accumulation of human capital and the supply of labour (Trostel, 1993), corporate taxation dampens investment (Hall & Jorgenson, 1967; Hassett & Hubbard, 1996), while leaning more towards consumption and immovable property taxes improve the level of economic growth (Arnold, Brys, Heady, Johansson, Schwellnus & Vartia, 2011).

The level of development already attained by an economy determines the revenue accruable from different sources of taxes. Developing economies, the prevalent case in Africa, with less sophisticated tax administration rely more heavily on indirect taxes, especially trade taxes, than the more advanced economies would (Musgrave, 1969; Sanford, 2000). In addition, the nature of the political system also influences what tax policies are pursued and what the tax structure would be (Cukierman, Edwards & Tabellini, 1992).

Countries in Africa, most of which are resource-rich, depend more on natural resources to finance public expenditure because of the large flows of revenue they receive from these resources. As a consequence, the structures of state that pertain to economic management and tax administration in these countries are weak and underdeveloped (Rosser, 2006). The countries have, therefore, remained largely underdeveloped with unstable growth rates resulting from the instability in international commodity prices, on which they are heavily dependent, and a low capacity to raise taxes to finance the provision of the public good. As a result, these countries have inadequate infrastructure and financial capacity to sustain rapid and stable economic growth, which, though not an end in itself, is a means to empower societies to achieve fundamental social objectives that improve the quality of wellbeing (Prasad, Singh & Swami, 2014). Furthermore, the weak and ineffective tax systems that generate insufficient tax revenue have led to government spending being financed by seigniorage, which is inflationary, with adverse effects on the economies (Cukierman, Edwards & Tabellini, 1992; Aisen & Veiga, 2006).

This paper analyses the relationship between the tax structure and economic growth in Africa. The continent, which is made up of fifty four (54) politically independent countries, is largely underdeveloped and home to a large proportion of the poorest people in the world. The analysis covers fifty two (52) out of the 54 countries in the

continent for the period 1980 to 2020. Using a dynamic method, the analysis in the paper seeks to determine how the tax structure affects economic growth. In order to achieve the paper's objectives, it has been structured into six sections. Section one is the introduction followed by literature review in section two while section three is a discussion on tax structure and economic growth in Africa. Section four contains data and methods with empirical analysis as well as conclusion and policy implication in sections five and six, respectively.

LITERATURE REVIEW
The Concept of Tax Structure

Tax structure refers to the composition of public revenue with respect to the different sources of tax and the structural features of particular taxes. These structural features include the definition of the tax bases, the nature and extent of deductions and exemptions, and the schedules of tax rates (Hettich & Winer, 1984). In this paper, the composition of public revenue has been broadly divided into direct taxes and indirect taxes.

Taxes are divided into direct taxes and indirect taxes mainly for administrative purposes, indicated by whether the taxpayer is directly, or through some third party, assessed for tax (Sanford, 2000). The distinction is also made between direct taxes and indirect taxes based on the ease with which the tax can be shifted from the taxpayer to the consumer (Due & Friedlaender, 1973). Still another distinction is made with regard to whether the tax can be adjusted to the individual characteristics of the taxpayer, as in the case of direct taxes, whereas indirect taxes are levied on transactions irrespective of the characteristics of the buyer or seller (Atkinson & Stiglitz, 1980). Yet another distinction considers income and capital expenditure as direct taxes while taxes on expenditure as indirect (Sanford, 2000).

Taxes on labour, which are direct taxes, according to Diamond and Mirrlees (1971), are distortionary and affect the supply of labour and hence productivity. They, therefore, recommend lump sum taxes as the first-best allocation because they are non-distortionary. Atkinson and Stiglitz (1976) stated that in the absence of any distributional objectives and if government is concerned solely with efficiency, it may employ a poll tax, a direct tax that does not regard the particular circumstances of the taxpayer. Direct taxes, particularly income tax, have been recommended mainly where the objective of policy is income redistribution (Atkinson & Stiglitz, 1980; Sung & Park, 2011).

Cremer, Pestieau and Rochet (2001), however, showed differential commodity taxes do have a role to play as instruments of optimal tax policy and, unlike Atkinson and Stiglitz (1976), they hold that an optimal (general) income tax will not be sufficient. Indirect taxes, however, have a different effect on economic activity from direct taxes. Because they are often levied on expenditures, they tend to affect taxpayers without discrimination based on their individual characteristics, such as income. They are, therefore, non-distortionary in their effect on the supply of labour and because of the many collection points of the indirect taxes, particularly the value added tax (VAT), making the total collection of such tax less obvious to the taxpayer, the likelihood of changing the behaviour of the taxpayer is even further lowered.

The tax structure applied in an economy goes beyond the mere considerations for optimality proposed by Atkinson and Stiglitz (1976) and Cremer, Pestieau & Rochet (2001). The level of development of an economy also determines what taxes are applied and the revenue accruable from them. As the income per capita of a country reaches higher levels, the personal income tax and other direct taxes, such as the corporate profit tax, are assigned much greater importance (Musgrave, 1969). Developing countries, unlike the developed countries, rely more heavily on indirect taxes for revenue (Sanford, 2000). The unsophisticated tax administration in these countries implies that they are unable to develop and maintain an elaborate database of taxable individuals and their taxable activities, and where the tax morale is generally low, the enforcement costs ensure that taxes are concentrated in a few sectors and activities. Among these few activities are international trade, where governments can administer excise duties and trade taxes at the few visible ports that they administer. Excise duties, having a physical base rather than an accounting base, are much easier for an unsophisticated tax administration to manage (Sanford, 2000).

Tax Structure and Economic Growth

The tax structure has been shown to affect economic growth through a number of channels including human capital accumulation, investment and political instability. Lee and Gordon (2005) have shown that an equilibrium capital-labour ratio and an equilibrium level of education per worker are generated by any given tax structure. When tax policy changes, however, these equilibrium values can change, thus generating transitory growth effects. Trostel (1993) found that proportional income taxation had a significant negative effect on human capital accumulation.

Hall and Jorgenson (1967) and Hassett and Hubbard (1996) have shown that changes in tax policy bring about changes in investment behaviour, which have effects on the growth of the economy. Low current effective tax rates on new investment indicate faster short-run growth resulting from an investment boom (Lee & Gordon, 2005).

Hassett and Hubbard (1996) further made a distinction between the effect of income tax and consumption tax on investment decision; whereas under the income tax, the corporate tax rate, investment tax credits, and the present value of depreciation allowances influence the user cost of capital, under the consumption tax, where there is no investment tax credit and investment is expensed, taxes do not distort business investment decisions. Investments are thus based on non-tax fundamentals under the consumption tax.

Taxes have also been shown to have an effect on entrepreneurship. Gentry and Hubbard (2000) found that more progressive personal income taxes (with imperfect loss offsets) discourage entrepreneurial activity. If the tax rate on income from successful entrepreneurial activity is higher than that on income from current employment (where the income from the successful entrepreneurial activity is higher than the wages from current employment and losses are not offset), the risk of entrepreneurial entry is higher and, therefore, entry is discouraged. For a non-corporate business, profits push the entrepreneur unto a higher marginal tax bracket, where he is taxed at a greater percentage, while losses provide little savings in taxes with progressive taxes (Lee & Gordon, 2005). Risk-taking is, therefore, discouraged.

Also, tax structure has been found to have effects on political stability. Because of the loss in consumption occasioned by the imposition of tax on the taxpayer, it has been shown that taxes serve as catalysts that provoke political discontent. In particular, the more visible of the broadly defined direct taxes and indirect taxes being the direct taxes, when increased relative to indirect taxes, have been found to have an inverse relationship with the level of political stability. This is especially true of countries in Africa where direct taxes are traditionally high relative to the indirect taxes and in countries which have been affected by conflict (Dalyop, 2020). Political instability has adverse effects on the level of economic growth and has been shown to be associated with economic instability in Africa (Dalyop, 2019).

Empirical Review
Empirical studies have found varying effects of different taxes on economic growth. The personal income tax has been shown to be associated with lower economic growth (Arnold, 2008; Acosta-Ormaechea & Yoo, 2012). Arnold (2008) found evidence of a negative relationship between the progressivity of personal income

taxes and growth. Property tax was, on the other hand, the most recommended by previous studies in the enhancement of economic growth as opposed to income tax (Arnold et al., 2011; Xing, 2011; Acosta-Ormaechea & Yoo, 2012).

Empirical studies on the relationship between the tax structure and economic growth in the African continent (or parts of it) have shown an inverse relationship between economic growth and income tax in Tanzania (Maganya, 2020) and South Africa (Dladla & Khobai, 2018), and direct taxes in general in selected Economic Community of West African States (ECOWAS) countries of Nigeria, Ghana, Sierra Leone, Benin and Burkina Faso (Oboh, Chinonyelum & Edeme, 2018). Other studies found that direct taxes, including petroleum profit tax and company income tax in Nigeria (Amah, 2021), had a direct relationship with economic growth. Indirect taxes, including the goods and services tax in Tanzania (Maganya, 2020), on the other hand, have a direct relationship with economic growth, while other studies found an inverse relationship (Gbato, 2017).

Most of the studies recommended a shift from the income tax towards property tax (Xing, 2011; Acosta-Ormaechea & Yoo, 2012), value added tax (Acosta-Ormaechea & Yoo, 2012) and consumption taxes, in general (Arnold, 2008), in order to enhance economic growth. Arnold, et al. (2011) additionally stated that the reduction of income tax for low-income earners showed the most promise in terms of both increased economic growth and economic recovery.

TAX STRUCTURE AND ECONOMIC GROWTH IN AFRICA
Countries on the African continent are characterized by low tax collection as many of them are largely resource dependent. Moreover, because these are developing countries, tax administration systems are underdeveloped owing to the large informal sectors in these countries and they are largely dependent on indirect taxes, especially international trade taxes such as customs duties (Sanford, 2000). As a consequence, direct taxes account for a smaller proportion of tax revenues in most of the African countries, because these taxes require greater sophistication of the tax administration system with sufficient information on a large proportion of the taxable individuals and their sources of income. Besides the weak tax administration in these countries, widespread poverty and illiteracy, as well as, as a sense of disconnection between the general populace and government policy, an extensive and reliable database of taxable individuals and their income generating activities cannot be built.

Furthermore, because of the fewer collection points, which are mainly located at ports with physical rather than accounting base, excise duties are much easier to administer for an unsophisticated tax administration (Sanford, 2000). This situation couples well, however, with the protectionist tendencies of the developing countries in Africa.

For the period between 1980 and 2000, only South Africa consistently collected more revenue from direct taxes (excluding social contributions and resource revenue) than (the non-resource component of) indirect taxes for the 35 years for which data is available. The same is true for Zimbabwe in 21 out of the 38 years for which data is available. For the remaining African countries, the annual collection of indirect taxes regularly exceeded direct taxes except for some isolated instances in Botswana (1989), Republic of Congo (1992), Egypt (2006–2009), Equatorial Guinea (2009–2011), Eritrea (1998, 1999), Ghana (2019),[2] Guinea (1982), Kenya (2013), Libya (2007–2011), Mozambique (2013), Nigeria (1993), Sierra Leone (2012) and Zambia (2010), where the data is available (United Nations University World Institute for Development Economics Research; UNU-WIDER, 2021).

Moreover, for the period 1980 – 2020, only South Africa collected direct taxes that exceeded an average of 10% of annual Gross Domestic Product (GDP), averaging just over 15%, as shown in Appendix A. Thirteen (13) other countries' collection of direct taxes exceeded an average of 5% of annual GDP, while the remaining 38 countries averaged less than 5% of annual GDP (Somalia and South Sudan are excluded in this analysis due to insufficiency of data) (UNU-WIDER, 2021).

For indirect taxes, 42 countries collected indirect taxes in excess of an average of 5% of annual GDP, 11 of which exceeded an average of 10% of annual GDP, the highest being Lesotho at an average of just over 30% of annual GDP. Only 10 countries collected indirect taxes averaging less than 5% of annual GDP for the period (UNU-WIDER, 2021).

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[2]For Ghana, because the **Non-Resource Component of Indirect Tax** is omitted, total **Indirect Taxes** (including resource revenue) and **Direct taxes excluding social contributions, including resource revenue** instead of **Direct taxes excluding social contributions and resource revenue** were used. For all the other countries except Cameroun and Egypt, the **Non-Resource Component of Indirect Tax** was used as Indirect Tax, while **Direct taxes excluding social contributions and resource revenue** was used as Direct Tax.
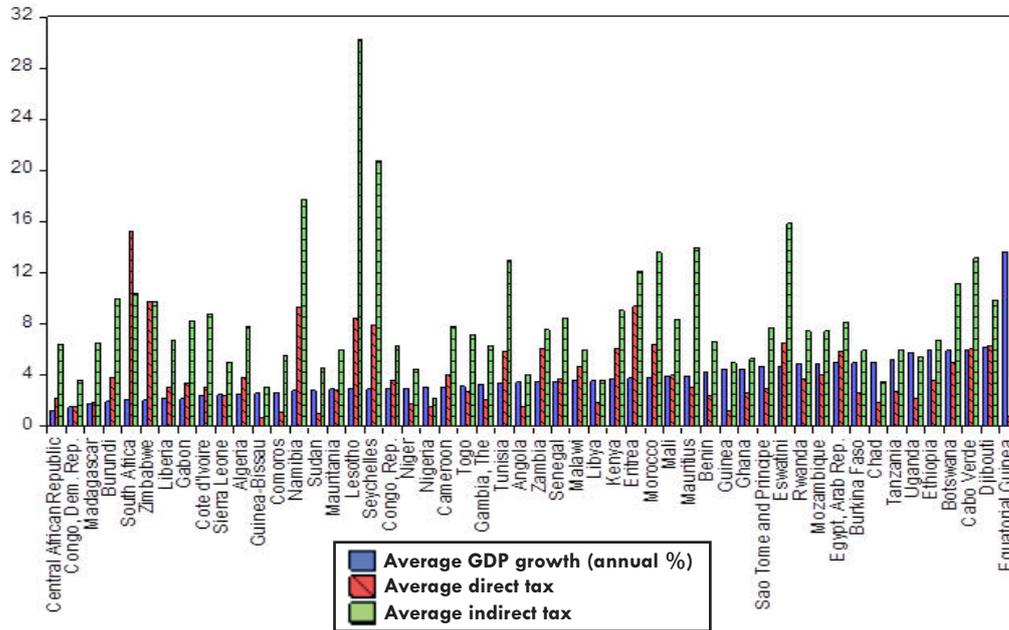
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Figure 1: Average direct taxes, indirect taxes and GDP growth 1980–2020

Figure 1 shows the relationship between the average direct taxes, average indirect taxes and the average GDP growth rate in African countries between 1980 and 2020. The average GDP growth rate appears to decline with higher average direct taxes. On the other hand, the average GDP growth rate appears to move in the same direction with the average indirect taxes, except for some extreme cases in Lesotho and Seychelles.

DATA AND METHODS

The study area is comprised of 52 (out of the 54) countries in Africa for the period 1980 to 2020. Somalia and South Sudan were excluded due to insufficiency of data.

The data on taxes were retrieved from the United Nations University World Institute for Development Economics Research (UNU-WIDER) 2021 Government Revenue Dataset (UNU-WIDER, 2021). The Political Stability and Absence of Violence estimate, which run from 1996 to 2020, with the years 1997, 1999 and 2001 unreported, were sourced from the World Governance Indicators (World Bank, 2021), while economic and demographic data were retrieved from the World Development Indicators (World Bank, 2022).

The model specifies economic growth rate as a function of the preceding period's level of economic growth, the direct taxes-to-total taxes ratio (DTR), monetary sector credit to the private sector, the level of political stability, urban population, and merchandise trade, which is the indicator for the openness of the economy.

$$\Delta Y = f(\Delta Y_{it-1}, DTR_{it}, Credit_{it-1}, PS_{it}, Urban_{it}, MT_{it}) \tag{1}$$

The System Generalized Method of Moments (SGMM) (two-step estimation) procedure developed by Arellano and Bover (1995) and Blundell and Bond (1998) was applied in analysing the following econometric model to account for the possibility of endogeneity among the explanatory variables.

$$\Delta Y_{it} = \alpha_i + \gamma_1 \Delta Y_{it-1} + \gamma_2 DTR_{it} + \gamma_3 Credit_{it-1} + \gamma_4 PS_{it} + \gamma_5 Urban_{it} + \gamma_6 MT_{it} + \varepsilon_{it} \tag{2}$$

for $i = 1, \ldots, N$, $t = 1, \ldots, T$, where ΔY_{it} is the economic growth rate for country i in the year t. For the set of government revenue sources (R) for the respective countries i in year t, DTR_{it} is the ratio of direct taxes-to-total taxes (DTR). The DTR variable is expected to be inversely related to the economic growth rate. For the economic variable (E), $Credit_{it}$ is the monetary sector credit to the private sector, while for socio-political and demographic variables (SPD), PS_{it} is the indicator for the level of political stability and $Urban_{it}$ is for urbanization. Merchandise trade (MT_{it}) is the external sector (Ext) variable; α_i is the country-specific effect that captures the characteristics that are unchanged over time. The parameters to be estimated are $\gamma_1, \gamma_2, \ldots, \gamma_6$ and ε_{it} is an independently and identically distributed (i.i.d.) error term.

Direct taxes (as a percentage of GDP) and indirect taxes (as a percentage of GDP) are presented in the model as the ratio $\frac{Direct\ taxes\ (DT)}{Direct\ taxes\ (DT) + Indirect\ taxes\ (IT)} = \frac{Direct\ taxes\ (DT)}{Total\ taxes\ (TT)}$ and represented in the model as DTR. This allows for the measurement of the effect on economic growth of altering direct taxes as a proportion of total taxes.

The monetary sector credit to private sector *(Credit)* variable is included in the model with a lag to account for the lag between investment and output. Additionally, the lag of the variable is used in order to remove the possibility of endogeneity in the model that would have arisen if the current value of the variable were used, which would have necessitated including *Credit* as an endogenous variable and then risk

increasing the number of instruments in the model. The minimization of endogenous variables in the model is pursued in order to not increase the number of instruments to an excessive level such that the Hansen test "generates implausibly good p-values of 1.000" (Roodman, 2009:98). The lag of *Credit* is expected to have a direct relationship with the economic growth rate.

Political stability (*PS*) is included in the model as an endogenous variable. Previous studies have found a bi-directional relationship between political stability and economic growth (Dalyop, 2019). It is expected that political stability will have a direct relationship with economic growth.

The demographic variable in the model is urban population (as a percentage of total population) (*Urban*). Urbanization has been found in the literature to have a positive influence on economic growth in Africa (Getaneh, 2016). However, other studies have found that in less developed economies with limited employment opportunities and economic infrastructure, urbanization has an adverse effect on economic growth (Prasad, Singh & Swami, 2014). Given the inadequate infrastructure in congested urban slums and limited employment opportunities in many African economies, it is expected that urbanization will have an inverse relationship with economic growth.

Merchandise trade (*MT*) is the external sector variable in the model. An open economy engaging in trade with the rest of the world is expected to reap benefits of technological innovation and market outlets for its output. Merchandise trade is, therefore, expected to have a direct relationship with economic growth.

One lag of the dependent variable (GDP growth rate) is used as an explanatory variable, while a maximum of one lag of the dependent variable is used as an instrument. In the estimation of the covariance matrix, robust standard errors were used in order to avoid the bias of the GMM two-step standard errors.

EMPIRICAL ANALYSIS
Empirical Results
Table 1 presents the results of the two-step SGMM regression estimation of the model. The results of the Sargan-Hansen test for over identifying restrictions (Arellano & Bond, 1991) for the respective columns, being statistically non-significant, satisfy the hypothesis that the instruments are valid (that is, the

instruments are uncorrelated with the error term) and the excluded instruments are correctly excluded from the estimated equation. The significant Wald Chi-squared test results, on the other hand, indicate that the explanatory variables in the model have a statistically significant effect on the model.

With regard to the autoregressive (AR) processes, AR(1), in line with expectations, is statistically significant, indicating the presence of first-order serial correlation resulting from the inclusion of the lag of the dependent variable (GDP growth) in the model. Similarly, AR(2) and AR(3), as expected, are statistically non-significant, indicating the absence of second- and third-order autocorrelation.

Columns R and R,E on the left-hand-side (LHS) of Table 1 show that DTR has a statistically significant inverse relationship with the economic growth rate, indicating that an increase in direct taxes, without a proportional increase in indirect taxes, results in a decline in the economic growth rate. This implies that, without a proportional increase in indirect taxes, any increase in direct taxes will lower economic growth rate. From the perspective of indirect taxes, the coefficients

for the ratio of indirect taxes-to-total taxes ($\frac{Indirect\ taxes\ (IT)}{Total\ taxes\ (TT)}$ or ITR) (not shown) were

found to be identical to those found for the ratio of indirect taxes-to-total taxes ($\frac{Direct\ taxes\ (DT)}{Total\ taxes\ (TT)}$ or DTR), except for the change in the signs of the coefficients. In this

case, increasing indirect taxes, without a proportional increase in direct taxes, will raise economic growth rate. These findings are in line with Dladla and Khobai (2018), Oboh, Chinonyelum and Edeme (2018) and Maganya (2020), for direct taxes (or a component of direct taxes, namely, income tax), and Maganya (2020), for indirect taxes.

Table 1: Two - Step (Robust) SGMM Regression: GDP growth (annual %) (lags (1) maxldep (1)), Direct tax-to-Total tax Ratio, Monetary sector credit to private sector (MSCreditPS) (% GDP), Political stability (WGI Political Stability and Absence of Violence/Terrorism (PSAV/T): Estimate) (endogenous; lagstruct(0,1)), Urban population (% of total population), Merchandise trade (% of GDP)

	All 52 countries				Average Direct-to-Indirect Tax Ratio $(1980-2020) \geq 3{:}10$			
	(R)	(R,E)	(R,E,SPD)	(R,E,SPD,Ex)	(R)	(R,E)	(R,E,SPD)	(R,E,SPD,Ex)
L.GDP growth	0.0120	0.139**	0.134***	0.127***	0.00741	0.140*	0.125***	0.116***
	(0.145)	(0.047)	(0.023)	(0.030)	(0.139)	(0.069)	(0.023)	(0.024)
Direct/Total Tax	-36.39**	-27.85**	-6.648	-7.570	-43.16**	-31.77***	-9.064*	-8.842*
	(12.484)	(9.921)	(5.743)	(5.159)	(13.534)	(4.792)	(4.596)	(4.328)
L.MSCreditPS		-0.0484	-0.170	-0.171		-0.0294	-0.135	-0.0988
		(0.043)	(0.119)	(0.117)		(0.060)	(0.100)	(0.100)
PSAV/T: Estimate			3.125**	3.100*			3.350*	2.877*
			(1.167)	(1.253)			(1.339)	(1.224)
Urban population			-0.228***	-0.232***			-0.231***	-0.211***
			(0.043)	(0.042)			(0.038)	(0.042)
Merchandise trade				0.0145				0.00934
				(0.024)				(0.020)
Constant	15.34***	12.92***	19.93***	19.47***	18.34***	14.37***	21.10***	18.90***
	(3.940)	(3.393)	(2.314)	(2.898)	(4.560)	(2.900)	(2.560)	(3.256)
No. of observations	1310	1228	696	696	1133	1062	614	614
No. of countries	52[a]	50	50	50	45[b]	43	43	43
No. of instruments	80	81	78	79	80	81	78	79
Hansen (p-value)	0.9897	0.9957	0.9922	0.9930	0.9993	0.9999	0.9996	0.9999
AR1 (p-value)	0.0291	0.0093	0.0001	0.0001	0.0323	0.0192	0.0002	0.0002
AR2 (p-value)	0.3612	0.5065	0.1566	0.1526	0.3864	0.6072	0.2296	0.2086
AR3 (p-value)	0.4692	0.6173	0.0598	0.0600	0.3860	0.5095	0.1636	0.1629
Wald chi2	13.18	13.82	141.22	156.53	14.61	227.59	105.05	70.08
Chi2 (p-value)	0.0014	0.0032	0.0000	0.0000	0.0007	0.0000	0.0000	0.0000

Standard errors in parentheses

$^{*}p<0.05$, $^{**}p<0.01$, $^{***}p<0.001$

[a] Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo, Dem. Rep., Congo, Rep., Cote d'Ivoire, Djibouti, Egypt, Arab Rep., Equatorial Guinea, Eritrea, Eswatini, Ethiopia, Gabon, Gambia, The, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, South Africa, Sudan, Tanzania, Togo, Tunisia, Uganda, Zambia, Zimbabwe.

[b] Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Congo, Dem. Rep., Congo, Rep., Cote d'Ivoire, Djibouti, Egypt, Arab Rep., Equatorial Guinea, Eritrea, Eswatini, Ethiopia, Gabon, Gambia, The, Ghana, Kenya, Lesotho, Liberia, Libya, Malawi, Mali, Mauritania, Morocco, Mozambique, Namibia, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, South Africa, Tanzania, Togo, Tunisia, Uganda, Zambia, Zimbabwe.

The right-hand-side (RHS) of Table 1 shows the results of the same analyses on the LHS, but for countries where the average direct taxes-to-indirect taxes ratio (DITR) from 1980 to 2020 is greater than or equal to 3:10. That is, for these countries, the average direct taxes for the period are greater than or equal to 30% of the average indirect taxes for the same period. Forty-five (45) countries, which are listed below Table 1, make up this group of countries. The results here show that a statistically significant inverse relationship exists between DTR and economic growth rate, and this result is consistent for each of the models, which progressively include revenue (R), economic (E), socio-political and demographic (SPD), and external sector (Ex) variables. The same is not true for countries where the average DITR is less than

3:10, as the results found for this group of countries were not statistically significant (and, therefore, not shown). This implies then that for countries with traditionally higher direct taxes (in this case, direct taxes being greater than or equal to 30% of indirect taxes), increasing the direct taxes, without a proportional increase in the indirect taxes, will result in lower economic growth rates.

The lag of the GDP growth rate and the political stability estimate both indicate significant direct relationships with the GDP growth rate. This indicates that a more stable political environment, in line with Dalyop (2019), supports the growth of the economy. Interestingly, however, urbanization shows a significant inverse relationship with the economic growth rate, indicating that the often congested and poorly planned urban areas in Africa with poor infrastructure and limited employment opportunities impede growth of the economies, as was found by Prasad, Singh & Swami (2014).

Robustness Check

The analysis re-specified the key variable in the model as the ratio of direct tax-to-indirect tax (DITR) to check the robustness of the results found. Equation 2 is, therefore, re-specified as:

$$\Delta Y_{it} = \alpha_i + \gamma_1 \Delta Y_{it-1} + \gamma_2 DITR_{it} + \gamma_3 Credit_{it-1} + \gamma_4 PS_{it} + \gamma_5 Urban_{it} + \gamma_6 MT_{it} + \varepsilon_{it} \quad (3)$$

where $DITR_{it}$ is the ratio of direct taxes-to-indirect taxes (DITR) for country i in the year t.

Table 2: Two-Step (Robust) SGMM Regression: GDP growth (annual %) (lags (1) maxldep (1)), Direct tax-to-Indirect tax Ratio, Monetary sector credit to private sector (MSCreditPS) (% GDP) , Political stability (WGI Political Stability and Absence of Violence/Terrorism (PSAV/T): Estimate) (endogenous; lagstruct(0,1)), Urban population (% of total population), Merchandise trade (% of GDP)

	(R)	(R,E)	(R,E,SPD)	(R,E,SPD,Ex)
L.GDP growth	0.00386	0.145**	0.136***	0.128***
	(0.121)	(0.050)	(0.023)	(0.032)
Direct/Indirect Taxes	-14.56***	-7.686***	-3.218*	-2.704*
	(1.785)	(2.087)	(1.368)	(1.232)
L.MSCreditPS		-0.0392	-0.163	-0.157
		(0.042)	(0.118)	(0.117)
PSAV/T: Estimate			3.210**	2.999*
			(1.229)	(1.381)
Urban population			-0.223***	-0.225***
			(0.043)	(0.043)
Merchandise trade				0.0164
				(0.025)
Constant	11.46***	7.926***	19.14***	17.84***
	(1.212)	(1.461)	(2.200)	(2.913)
No. of observations	1310	1228	696	696
No. of countries	52	50	50	50
No. of instruments	80	81	78	79
Hansen (p-value)	0.9964	0.9970	0.9931	0.9946
AR1 (p-value)	0.0218	0.0104	0.0001	0.0001
AR2 (p-value)	0.2511	0.5719	0.2569	0.2312
AR3 (p-value)	0.2755	0.5395	0.1931	0.1433
Wald chi2	82.72	15.90	142.47	151.01
Chi2 (p-value)	0.0000	0.0012	0.0000	0.0000

Standard errors in parentheses
Sources: UNU-WIDER. (2021). Government Revenue Dataset. doi: 10.35188/UNU-WIDER/GRD-2021; World Bank. (2021, September 09). World Governance Indicators; World Bank. (2022, February 15). World Development Indicators.
$^*p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

The results found for this analysis (shown in Table 2) are largely similar to those found for the analyses in Table 1. All columns show that DITR has a statistically significant inverse relationship with the economic growth rate, indicating that a rise in the direct taxes relative to indirect taxes results in a decline in the economic growth rate. This implies that holding the indirect taxes constant, any increase in the direct taxes will lower the economic growth rate. Stated from the perspective of the indirect taxes, increasing the indirect taxes, while holding the direct taxes constant, will raise the economic growth rate. This result is consistent for each of the models, which progressively include revenue (*R*), economic (*E*), socio-political and demographic (*SPD*), and external sector (*Ex*) variables.

CONCLUSION AND POLICY IMPLICATION

The focus of this paper is the relationship between the tax structure and economic growth in Africa. The reviewed literature indicated a dampening effect of direct taxes, particularly the personal income tax and corporate profit tax, on economic growth, while property taxes and consumption taxes were recommended in order to enhance growth. Using data from 52 African countries for the period 1980 to 2020, the analysis found a significant inverse relationship between the DTR (and the DITR) and economic growth.

Thus, the paper concludes that higher direct taxes as a proportion of total taxes (or relative to indirect taxes) lead to slower economic growth on the continent. The policy implication of this finding is that any increase in the direct taxes, without a proportional increase in indirect taxes (or while holding the indirect taxes constant), will lower the economic growth rate. From the contra position, increasing the indirect taxes, without a proportional increase in direct taxes (or while holding the direct taxes constant), will raise the economic growth rate.

A limitation encountered in the analyses carried out in this paper is the unavailability of data on the tax rates applied annually in the countries covered in the analysis and for the period covered by the study. The analyses, therefore, relied solely on data on the tax collections as a proportion of annual GDP.

The paper recommends that to enhance economic growth, increases in tax rates or the enforcement of tax laws should place greater emphasis on indirect taxes. Caution should, however, be applied in the design and enforcement of direct taxes in order to avoid the negative effects their enforcement could have on the economies. Furthermore, future analyses should consider the effects of tax rates, and not just tax collections, on economic growth in these countries.

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APPENDIX

Direct taxes and indirect taxes (% of GDP), and GDP growth rate

S/No	Country name	Average (1980 - 2020)			
		direct taxes	indirect taxes	direct taxes-to-indirect taxes ratio (DITR)	GDP growth (annual %)
1	Algeria	3.78	7.82	0.49	2.54
2	Angola	1.51	3.99	0.38	3.45
3	Benin	2.36	6.60	0.38	4.27
4	Botswana	4.98	11.11	0.47	5.91
5	Burkina Faso	2.58	5.94	0.34	4.96
6	Burundi	3.83	9.95	0.39	1.92
7	Cabo Verde	6.01	13.17	0.46	5.94
8	Cameroon[†]	4.04	7.78	0.55	3.07
9	Central African Republic	2.21	6.41	0.34	1.17
10	Chad	1.84	3.46	0.55	5.01
11	Comoros	1.08	5.58	0.20	2.61
12	Congo, Dem. Rep.	1.51	3.54	0.43	1.47
13	Congo, Rep.	3.63	6.32	0.59	2.94
14	Cote d'Ivoire	3.02	8.80	0.34	2.43
15	Djibouti	6.31	9.84	0.67	6.21
16	Egypt, Arab Rep.[†]	5.80	8.10	0.73	4.95
17	Equatorial Guinea	0.76	3.80	0.53	13.67
18	Eritrea	9.38	12.16	0.80	3.78
19	Eswatini	6.53	15.85	0.44	4.70
20	Ethiopia	3.64	6.72	0.54	5.91
21	Gabon	3.38	8.20	0.42	2.14
22	Gambia, The	2.09	6.32	0.34	3.27
23	Ghana[†]	2.61	5.29	0.47	4.50
24	Guinea	1.26	4.96	0.26	4.45
25	Guinea-Bissau	0.70	3.02	0.23	2.57
26	Kenya	6.02	9.05	0.67	3.67
27	Lesotho	8.40	30.20	0.31	2.90
28	Liberia	3.01	6.76	0.41	2.14
29	Libya	1.81	3.62	0.96	3.57
30	Madagascar	1.88	6.52	0.29	1.80
31	Malawi	4.65	5.98	0.75	3.56
32	Mali	3.97	8.36	0.42	3.92
33	Mauritania	2.83	5.97	0.48	2.90
34	Mauritius	3.00	13.93	0.22	3.94
35	Morocco	6.35	13.57	0.46	3.82
36	Mozambique	4.02	7.42	0.40	4.92
37	Namibia	9.29	17.74	0.54	2.81
38	Niger	1.74	4.46	0.24	2.98
39	Nigeria	1.51	2.19	0.66	3.06
40	Rwanda	3.64	7.43	0.44	4.92
41	Sao Tome and Principe	2.96	7.69	0.38	4.66
42	Senegal	3.71	8.46	0.31	3.48
43	Seychelles	7.89	20.75	0.38	2.91
44	Sierra Leone	2.42	5.02	0.50	2.48
45	South Africa	15.20	10.39	1.48	2.03
46	Sudan	1.03	4.53	0.26	2.81
47	Tanzania	2.69	5.96	0.45	5.16
48	Togo	2.69	7.17	0.45	3.11
49	Tunisia	5.84	13.00	0.46	3.40
50	Uganda	2.15	5.46	0.38	5.73
51	Zambia	6.02	7.53	0.84	3.46
52	Zimbabwe	9.77	9.73	1.00	2.05

Sources: UNU-WIDER. (2021). Government Revenue Dataset. doi: 10.35188/UNU-WIDER/GRD-2021; World Bank. (2021, September 09). World Governance Indicators; World Bank. (2022, February 15). World Development Indicators.
[†]For Cameroon, Egypt and Ghana, because the **Non-Resource Component of Indirect Tax** is either insufficient or omitted, total **Indirect Taxes** (including resource revenue) and **Direct taxes excluding social contributions, including resource revenue** instead of **Direct taxes excluding social contributions and resource revenue** were used. For all the other countries, the **Non-Resource Component of Indirect Tax** was used as Indirect Tax, while **Direct taxes excluding social contributions and resource revenue** was used as Direct Tax.