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ADDRESSING THE TAXATION-GROWTH CONUNDRUM IN SUB-SAHARA AFRICA

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ABSTRACT

The effect of taxation on economic growth is a well-researched topic in the existing literature. However, the literature is characterized by mixed and inconsistent conclusions. As a result, there is no common consensus on how taxes affect economic growth. This paper clears this ambiguity by showing that previous studies have overlooked an important link which is decisive for whether taxes enhance or impede economic growth. We apply a system GMM estimator to a panel dataset of thirty-eight Sub-Sahara African countries to show that the quality of institutions is the missing link. Specifically, higher taxes have a negative effect on economic growth only in the absence of a good quality of institutions. However, if good institutions are in place, the negative effect is nullified such that taxes become growth enhancing. Our results suggest that the institutional threshold for reversing this adverse effect is 0.58. Meaning that, in countries where the institutional quality is above 0.58, the tax revenue is likely to translate into economic growth. Furthermore, the study reveals that the institutional channel is not only significant for aggregate taxes but also for the individual tax components; taxes on income, profits and capital gains, taxes on goods and services and international trade taxes. We conclude that any taxation policies and or reforms that are intended to boost the development prospects of Sub-Sahara African countries should be accompanied by good, supporting institutions.

***JEL classification**: H24, O23, O43, O55*

***Keywords:** Economic growth, taxation, institutions, Sub-Sahara Africa*

1. INTRODUCTION

The use of fiscal policy as a tool for enhancing economic growth is quite a vehement topic in Economics. Taxes affect the level of consumption and

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saving at household level and the level of investment at firm levels, which in turn, affects the economic performance of a country. Moreover, effective domestic revenue mobilization offers an important medium through which developing countries can escape foreign aid or natural resource dependency to achieve sustainable development. The question of how taxation affects economic development is therefore of considerable interest. This is particularly important for Sub-Saharan Africa (SSA) countries where domestic tax revenue mobilization has been stagnant. On average, the tax revenue to GDP ratio in the region has been hovering around 15 per cent since the late 1990s while debt continues to spiral upward for most of the countries.

Meanwhile, economic growth in Africa has been lower than expected due to a sluggish global economy. In fact, according to the International Monetary Fund (IMF) estimates, economic growth in the region will slow to its lowest level in more than 20 years (IMF, 2016). In light of these factors, as well the decrease in global commodity prices and the ongoing financial and economic uncertainties that plague the SSA region, a comprehensive understanding by policymakers on how best to use fiscal measures to advance economic development is warranted.

The topic of how taxes affect economic growth has received considerable coverage in the literature. However, there exists a fundamental problem in that the literature is characterized by mixed and inconsistent conclusions on how taxes affect economic growth. On the one hand, studies by Takumah (2014), Nantob (2014), Anastassiou and Dritsaki (2005), and several others, discover a positive association between taxation and economic growth. While on the other, Demir and Sever (2016), Mahdavi (2008), and Johansson et. al. (2008), uncover a negative effect. Somewhere in between these two views lies a group of papers that substantially find no evidence of a robust and systematic effect of taxation on economic growth. These include N Yilimon (2014), Bujang *et. al.* (2013), Katircioglu (2010), Mendoza *et. al.* (1997), Slemrod (1995) and Koester and Kormendi (1989).

Moreover, several studies evaluate the effect of the different tax revenue components. Johansson *et. al.* (2008) uncovers that for OECD countries, taxes on corporate income, personal income and consumption negatively affect economic growth. Similarly, Demir and Sever (2016) found a negative effect of direct and indirect taxes on growth. The works of Nantob (2014) extends the analysis by investigating a non-linear relationship as well as how the individual tax components affect economic growth in developing countries. The author finds a U-shaped relationship between economic growth and international trade taxes, and taxes on income, profits and capital gains. Thus, taxes on income, profits, and capital gains as well as taxes on international trade lower economic growth in the short run, but over time, as these taxes increase, they tend to boost economic growth.

Using a panel dataset of SSA countries, we reconsider the relationship between taxation and economic growth from an empirical perspective using a system Generalised Method of Moments (GMM) estimator. Our paper however, takes a different route from existing studies which tend to predict only a monotonic effect. Our hypothesis is that differences in reported findings may be indicative of an important transmission channel; namely, the quality of prevailing institutions. In other words, whether taxation increases or hinders economic growth is decided by the quality of institutions. As motivation behind this hypothesis, our study draws upon two strands of evidence that document the importance of institutions towards both growth and tax revenue mobilization. The first is that weak institutions is one of the factors that prevent countries from achieving economic growth (Jones and Hall, 1999; Barro, 1999; Rodrik, 2001). The second hypothesis is that high government efficiency and institutional quality intercede in fully achieving effective tax collection performance (Torrance and Morrissey, 2014; Chong and Gradstein, 2007; Broms, 2011). From these arguments put together, our study postulates that in the presence of good institutions and governance, tax revenue will be directed towards productive and growth enhancing initiatives, leading to higher economic growth. However, in the absence of good institutions and governance, ample tax revenue may motivate leaders to use the tax revenue for their individual self-interest, consequently leading to less economic growth.

The findings from our study not only clear the ambiguity that exist in the present literature, but also give some direction on what SSA countries ought to do to realize the welfare benefits of taxation through economic growth. Our hypothesis turns out to be supported by consistent and robust econometric results. Furthermore, the paper undertakes a disaggregated analysis of total taxes to establish the impact of the different tax revenue components on economic growth. From this analysis, we investigate the tax revenue component through which the institutional effect is transmitted.

The rest of the paper is organized as follows; the next section, Section 2 explains the econometric model and estimation technique. Section 3 presents the data. Section 4 presents the estimation results. Finally, Section 5 concludes the paper. The Appendix contains a list of countries employed in this study and the stationarity tests for all the variables.

2. MODEL SPECIFICATION

The theoretical basis of this paper is the Barro (1990) endogenous growth model, which includes government spending and taxation as determinants of economic growth. The model postulates that taxation is used to finance public investments (infrastructures, schools, sanitation and other public services). Therefore, since public investments enhance the productivity of

private investments, higher taxes can be associated with an increase or decrease in economic growth. Barro (1990) adds public spending to the production function by Romer (1982). In its Cobb-Douglas specification, the aggregate production function is:

$$Y = AK^{(1-\alpha)}G^{\alpha} \tag{1}$$

$$G = \tau Y \tag{2}$$

Where; G is government spending; K is privately accumulated physical capital; A represents technology and captures total factor productivity, and τ is the tax rate. The assumption of this function is that G enhances private capital marginal productivity through the provision of public goods.

Substituting equation (2) into the production function from equation (1) yields:

$$Y = K^{1-\alpha}(\tau Y)^{\alpha} \tag{3}$$

Solving for Y in equation (3):

$$Y = A^{\frac{1}{1-\alpha}}(\tau^{\frac{\alpha}{1-\alpha}})K = \bar{A}(\tau)K \tag{4}$$

Where,

$$\bar{A}(\tau) = A^{\frac{1}{1-\alpha}}(\tau^{\frac{\alpha}{1-\alpha}}) \tag{5}$$

For the empirical estimation, a dynamic panel dataset for thirty Sub-Sahara African countries is used to estimate the following baseline regression model:

$$y_{it} = \alpha y_{it-1} + \gamma Tax\,\mathrm{Re}v_{it} + \tau InstQ_{it} + \delta(Tax\,\mathrm{Re}v * InstQ_{it}) + \eta TaxIT_{it} + \phi TaxGS_{it} + \psi TaxIPCG_{it} + \rho Tax * InstQ_{it} + \beta X_{it} + \mu_i + \varepsilon_{it} \tag{6}$$

Where; y_{it} is the dependent variable, GDP per capita growth rate of country i at time period t; y_{it-1} is the lag of GDP per capita growth rate and it this captures the dynamic nature of the GDP per capita growth rate; $TaxRev_{it}$ denotes total tax revenue; $InstQ_{it}$ represents the indicator of institutional quality; $TaxRev*InstQ_{it}$ which captures the essence of this analysis, is the interaction term between tax revenue and the quality of institutions; $TaxGS_{it}$ is the taxes on goods and services; $TaxIT_{it}$ denotes taxes on international trade; $TaxIPCG_{it}$ measures taxes on income profit and capital gains; $Tax*InstQ_{it}$ is the interaction terms between the individual tax revenue components and the quality of institution which, as already stated, identifies the tax instrument through which the institutional effect

is transmitted. ε_{it} is the error term, μ_i captures unobserved fixed effects for each country, and $\alpha, \gamma, \tau, \delta, \eta, \phi, \varphi, \theta, \beta$ are all coefficients to be estimated. In addition, we control for foreign direct investment, government expenditure, inflation and investment, which are captured by X_{it}.

The empirical model above could potentially introduce some difficulties. Firstly, the time-invariant unobserved country fixed effects may be correlated with the explanatory variables. In addition, the tax variables may be strictly exogenous and correlated with the idiosyncratic errors. Furthermore, the lagged dependent variables maybe correlated with country specific fixed effects (Nickell, 1981). To correct for these problems, we estimate the model using the system GMM estimator. The estimator controls the country specific effects, eliminates the invariant omitted variables and solves both variables endogeneity bias and simultaneous bias. Unlike the difference-GMM, the system GMM combines the equations in level and the first differences into a system to generate more efficient coefficient estimates.

The diagnostics shown at the bottom of Table 1 indicate that from a purely statistical point of view, the dynamic model estimated is robust. Firstly, the autocorrelation tests show that there is no second order autocorrelation in the first difference of the error term. Secondly, the Hansen test statistic is never significant at usual confidence levels, meaning that the over identifying restrictions implied by the use of lagged values as instruments cannot be rejected.

3. DATA

To estimate the empirical model, we use an unbalanced panel dataset for 38 SSA countries over the period 1996-2015. With the exception of the institutional variable, all data are sourced from The World Bank Development Indicators published by World Bank. The data for the institutional quality variable is obtained from the Political Risk Services International Country Risk Guide dataset.

The tax variables employed are total tax revenue (*TaxRev*), taxes on international trade (*TaxIT*), taxes on income, profits and capital gains (*TaxIPCG*), and taxes on goods and services (*TaxGS*). *TaxRev* is the ratio of total tax revenue to GDP. *TaxIT* includes exchange taxes, exchange profits, import duties and export duties. *TaxIPC* consists of levies on the net income of individuals, real assets, financial assets, and profits of businesses and organizations. *TaxGS* comprises of general sales taxes, value added taxes, selective excises on goods and services taxes, taxes on the use of property and taxes on minerals production. All the tax variables are expressed in proportion to GDP.

The quality of institutions is measured by the Political Stability and Absence of Violence indicator from the Political Risk Services International

Country Risk Guide (PRSICR) dataset. This measures insights of the likelihood of political instability and/or politically-motivated violence, including terrorism. The measurement follows a political risk rating of; 0.0% to 49.9% = Very High Risk; 50.0% to 59.9% = High Risk; 60.0% to 69.9% = Moderate Risk; 70.0% to 79.9% = Low Risk; and 80.0% or more = Very Low Risk. The index therefore ranges between 0 and 1. A higher index implies good quality of institution, hence a good environment for economic growth. Countries that are politically stable and have low violence can efficiently achieve human capital accumulation and achieve more government effectiveness which drives economic growth and development. Good institutions are therefore expected to stimulate economic growth. Tax*instQ represents the interaction term between the tax variables and institutional quality.

For the control variables, we specifically account for factors that most often recur in the existing literature and are also relevant for Sub-Saharan Africa. These are; foreign direct investment (FDI), which is expressed as net inflows as a percentage of GDP; the rate of inflation (INFL) as measured by the consumer price index; government expenditure (G), expressed as the ratio of general consumption spending by the government to GDP; and investment (I), which is measured as the ratio of gross fixed capital formation to GDP.

All the variables are tested for stationarity using a Fisher type panel unit root test. The test is fitting for our unbalanced dataset as it allows for gaps in the panel data. It also performs the Augmented Dickey–Fuller (ADF) and Phillips Perron (PP) tests for each panel. Both tests were performed in constant and with a trend. The ADF test shows that all variables are stationary at levels and also significant at 1 per cent level of significance. Leading us to reject the null hypothesis that there is no stationarity and conclude that the series is stationary. The results of both the ADF test and PP tests with trend suggest that all the variables are stationary at levels (See Table A.3 in the Appendices).

4. EMPIRICAL ANALYSIS

The findings from this study are presented in Table 1. The table reports the estimated coefficients as well as the robust standard errors of the estimates in brackets. The first thing that emerges from the table is that the lag of GDP per capita growth is significant across the models, which suggests that there is a dynamic effect. This means that economic growth from the single previous period can determine the level of economic growth in the current period.

Starting with column 1, the results suggest that a 1 per cent increase in tax revenue causes a 0.43 per cent decline in GDP per capita. This finding

that tax revenues lower economic growth is in line with the findings of Demir and Sever (2016), Mahdavi (2008) and Johansson *et. al*. (2008). Albeit insignificant, the coefficient for the quality of institutions carries the expected positive sign. The coefficient for the interaction with total tax revenue (*TaxRev*) which captures the essence of the analysis is significant and positive at the one per cent level. The combined effect of an increase in the level of tax revenue and the quality of institutions leads to an increase of 0.74 per cent in economic growth. This finding is quite intuitive and supports our earlier hypothesis, that in the absence of stable governing institutions, leaders may direct tax revenues towards their own self-benefit at the expense of societal welfare, leading to less economic growth. However, rather than end up amongst a few self-interested leaders, in the presence of a good political environment and leadership, the tax revenue collected can be invested in projects that promote economic growth,

To better understand the implication of our result, we compute the impact of a marginal increase in tax revenues on economic growth as:

$$\frac{\partial GDP_{percap}}{\partial Tax\,\mathrm{Re}v} = -0.43 + 0.74(InstQ) \tag{7}$$

This suggests that the institutional threshold for not having tax revenue affect economic growth adversely is -0.43/0.74= 0.58. Meaning that in countries where institutional quality is above 0.58, the tax revenue is likely to translate to economic growth.

For illustrative purposes Kenya and Botswana are used as examples. Kenya has a relatively high tax revenues ratio of 16.91 per cent, however with an institutional index of 0.57, which is below the average of 0.67 in the region. On the other hand, the institutional quality index of Botswana is 0.84 and also has relatively high tax revenues of 24.78 per cent. With its current institutions, a 1 point increase in Kenya's tax revenues produces a 0.14 point decrease in economic growth. However, if Kenya were to improve its quality of institutions to match that of Botswana, the decrease in economic growth brought about by the weak institutions that prevailing in Kenya, would translate into a 3.24 point increase in economic growth.[1]

Turning to the tax revenue components, our key finding is that the evidence linking the effect of tax revenue to the quality of institutions not only applies to total taxes but is transmitted through taxes on income profit and capital gains (TaxIPCG). Interestingly, the negative and significant coefficient for TaxIPCG is similar to Nantob (2014). However, we further show that coupled with good institutions, this result can be reversed as signified by the coefficient of the interaction term (TaxIPCGInstQ), which is positive and statistically significant at the 1 per cent level. Typically,

Table 1
Regression Results from the One-Step System GMM Estimator

	Model 1	*Model 2*	*Model 3*	*Model 4*	*Model 5*
lagGDPpercap	0.144060 (2.38)**	0.191743 (4.1)***	0.22479 (2.44)**	0.190547 (2.05)**	0.18972 (2.17)**
TaxRev	-0.42770 (-2.14)**	-0.81196 (-5.5)***	1.99104 (3.47)***	-1.80763 (-1.99)**	1.78974 (3.03)***
TaxGS	-0.80334 (-1.03)	-1.44795 (-1.96)**	-1.32527 (-0.98)	1.044509 (0.86)	1.005806 (0.89)
TaxIPCG	-0.65047 (-2.21)**	-0.64158 (-2.33)**	-0.73559 (-3.45)***	-0.76598 (-3.55)***	-0.75061 (-3.22)***
TaxIT	0.84532 (1.79)*	-0.95109 (-2.4)**	1.165557 (1.57)	-0.73538 (-1.76)*	-0.70374 (-1.05)
TaxRevInstQ	0.74344 (3.58)***	0.867915 (4.54)***	2.634533 (2.11)**	2.232735 (1.85)*	2.272083 (1.93)*
TaxGSInstQ	1.18967 (1.08)	2.126236 (2.01)**	1.975218 (0.98)	1.281775 (0.70)	1.376432 (0.75)
TaxIPCGInstQ	1.14133 (2.82)***	1.001467 (2.66)***	1.130988 (3.97)***	1.184978 (4.25)***	1.174106 (3.90)***
TaxITInstQ	-0.99806 (-1.63)	1.153096 (2.17)**	1.037957 (1.01)	0.858193 (1.52)	0.816881 (0.86)
InstQ	3.42748 (0.47)	0.661861 (0.10)	21.36602 (1.86)**	20.3587 (1.55)	21.56728 (1.63)
FDI		0.057605 (2.00)**			
INFL			-0.04021 (-1.77)**		
G				0.063053 (0.83)	
I					0.031351 (0.82)
_cons	1.51127 (0.761)	1.911315 (0.41)	6.117701 (1.12)	3.609041 (0.92)	2.994202 (0.72)
Wald test (Prob > chi2)	0.000	0.000	0.000	0.000	0.000
Sargan test: (p-value)	0.3651	0.4270	0.5410	0.5219	0.3578
2nd Order Serial Correlation: (p-value)	0.2918	0.5863	0.6075	0.7610	0.7660
Observations	182	202	196	183	187

Notes: 1. The asterix *, ** and *** indicates 10%, 5% and 1% level of significance; figures in the parenthesis are the z-statistics.

2. The Sargan test tests for over-identifying restrictions with the null hypothesis that the over-identifying restrictions are valid. According to the p-values we fail to reject the null hypothesis and confirm validity of over-identifying restrictions.

3. Under the AR (2) serial correlation test, the null hypothesis is that there is no second order serial correlation in first difference residual. The p-values suggest that we fail to reject the null hypothesis and confirm that there is no second order serial correlation in first difference residual for all the estimates.

TaxIPCG are more desirable because they are less distortive and have a broader tax base, as a result they constitute the major source of tax revenue in most developed countries. The finding in this study suggests that with the right institutions in place, countries in the Sub-Saharan African region can reap the benefits from these taxes.

As found by Nantob (2014), the coefficient for TaxGS is negative and insignificant. However, the interaction with the quality of institutions turns positive but is insignificant. An increase in taxes on international trade by 1 per cent leads to an increase in GDP per capita growth by approximately 0.845 per cent, as suggested by the positive and statistically significant coefficient for TaxIT. However, the interaction effect with institutions is not significant.

From column 2 onwards, we introduce additional regressors. In doing so, the sensitivity of the main results to the inclusion of additional controls is also tested since omitting these factors could lead to an overestimation of the true association of the interaction term and tax revenues. We find that the inclusion of these supplementary variables does not substantially alter the signs of the estimated coefficients. Across the models, the taxes which gave significant results, TaxRev and TaxIPCG and their interaction terms remain unchanged. The most interesting change observed in the results is that the coefficients for TaxGS and TaxGSInstQ turn significant with the inclusion of FDI in column 2. Intuitively, the coefficients for taxes on goods and services suggests that the wide move to adopt the VAT which started in the 1990's in place of sales and turnover taxes could be beneficial for growth if coupled with good supporting institutions. The quality of institutions turns significant and maintains a positive coefficient when we account for inflation in column 3.

Column 2 results indicate that an increase in FDI by one per cent leads to an increase in GDP per capita growth by about 0.058 per cent. This shows that, FDI improves overall effectiveness in economic activities, which in turn boosts economic growth. The negative coefficient from inflation in column 3 means that excessive inflation adversely affects economic growth. This finding is not surprising for SSA where countries like Angola, Zimbabwe and The Democratic Republic of Congo often reached inflation rates of above 100 percent during the period under observation.

Column 4 accounts for the effect of government expenditure. Although positive, government expenditure in SSA does not have a statistically significant effect on economic growth. A possible explanation to this finding has to with the quality and efficiency of expenditures, particularly with regards to health, education and infrastructure. For example, government expenditure in Botswana, although one of the largest in the region, has been characterized by large inefficiencies since the early 1990s. According

to a review by the World Bank, the country faces significant bottlenecks in the provision of quality public investment, particularly access to electricity supply and railways (World Bank, 2010). Therefore, in order to fully realize economic growth from public investment spending, a rigorous evaluation of public investment projects to address the quality and other shortcomings should become the focus of SSA governments.

5. SUMMARY AND CONCLUSION

The aim of this paper was to revisit and extend the evidence on the relationship between taxation and economic growth. Existing studies have tended to predict a non-monotonic effect and as a result, mixed findings have been found. Therefore unlike previous findings we investigate the possibility of the existence of a missing link behind the relationship between tax revenue and economic growth.

We find empirical support from our econometric analysis that institutions are decisive for whether taxation hampers or enhances economic growth in SSA. The evidence reveals that increasing total tax revenue leads to lower economic growth. However, if good institutions are in place, the effect is nullified such that total tax revenue becomes growth enhancing. Furthermore, our study investigated which tax instruments the institutional effect is transmitted. Results from our baseline regression point to the taxes on income, profits and capital gains. The institutional effect is also significant for taxes on goods and services and international trade taxes after controlling for FDI. It is therefore important that SSA governments and policymakers recognize that any taxation policies and or reforms that are intended to boost the development prospects of SSA countries should be accompanied by good, supporting institutions. Lastly, our empirical results emphasize the prominence of FDI on driving the economic growth of the economies in the region, and that a high inflation rate hinders their growth.

Note

1. Current institutions: ((-0.43+0.74(0.57)) 16.91=**-0.139**. Improved Institutions: ((-0.43+0.74(0.84))16.91=**3.24**

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APPENDIX

Table A.1
List of Sub-Saharan African Countries

Number	*Country Name*	*Number*	*Country Name*
1.	Angola	20.	Malawi
2.	Benin	21.	Mali
3.	Botswana	22.	Mauritius
4.	Burkina Faso	23.	Mozambique
5.	Cameroon	24.	Namibia
6.	Central African Republic	25	Niger
7.	Congo, Democratic Republic	26.	Nigeria
8.	Congo, Republic.	27.	Sao Tome and Principe
9.	Cote d'ivoire	28.	Senegal
10.	Ethiopia	29.	Seychelles
11.	Gabon	30.	Sierra Leone
12.	Gambia	31.	South Africa
13.	Ghana	32.	Sudan
14.	Guinea	33.	Swaziland
15.	Guinea-Bissau	34.	Tanzania
16.	Kenya	35.	Togo
17.	Lesotho	36.	Uganda
18.	Liberia	37.	Zambia
19.	Madagascar	38	Zimbabwe

Table A.2
Panel Unit Root Tests

Variables	*Augmented Dickey–Fuller(ADF)*						*Phillips Perron(PP)*		
	Constant			*Trend*			*Trend*		
	Statistic	*p-value*	*Order*	*Statistic*	*p-value*	*Order*	*Statistic*	*p-value*	*Order*
gdppc	505.593	0.0000	I(0)	432.330	0.0000	I(0)	432.330	0.0000	I(0)
TaxRev	101.161	0.0007	I(0)	98.942	0.0012	I(0)	98.942	0.0012	I(0)
TaxGS	98.1529	0.0000	I(0)	175.312	0.0000	I(0)	175.312	0.0000	I(0)
TaxIPCG	97.2075	0.0000	I(0)	148.748	0.0000	I(0)	148.173	0.0000	I(0)
TaxIT	129.545	0.0000	I(0)	160.942	0.0000	I(0)	160.942	0.0000	I(0)
InstQ	121.715	0.0000	I(0)	98.988	0.0000	I(0)	98.988	0.0000	I(0)
FDI	367.048	0.0000	I(0)	372.660	0.0000	I(0)	372.660	0.0000	I(0)
G	220.180	0.0000	I(0)	235.808	0.0000	I(0)	235.808	0.0000	I(0)
I	130.69	0.0000	I(0)	181.343	0.0000	I(0)	181.342	0.0000	I(0)
CPI	393.352	0.0000	I(0)	303.366	0.0000	I(0)	303.366	0.0000	I(0)

Note: gdppc= Gross Domestic Product per capita growth, TaxRev= Tax Revenue, TaxIT= taxes on international trade, TaxGS= taxes on goods and services, TaxIPCG= taxes on income, profits and capital gains, InstQ= political stability and absence of terrorism or violence, FDI= foreign direct investment, G= government expenditure, CPI= inflation rate and I= investment.