Democracy, Corruption and Income: Evidence from Sub-Saharan Africa

Michael Kwame Asiedu[1], Daniel Ofori[2]

[1]School of Management Sciences & Law, University of Energy & Natural Resources, Sunyani
[2]Department of Entrepreneurship and Finance, Kumasi Technical University, Kumasi

ABSTRACT: The objective of this paper is to investigate the effect that democracy and corruption have on income in sub-Saharan Africa. The results show that whether or not democracy has income effects depends on a particular indicator used. While property rights and political stability have had positive income effects rule of law and government effectiveness have shown negative impact on income over the period under consideration. Corruption has negative impact on income. The study concludes that policy reforms should target programs that seek to develop and build the capacities of judiciaries, legislatures, media and civil societies to help enforce rule of law and strengthen democratic institutions. For research, the findings imply that researchers should seriously take into account the selection of proxies when investigating the impact of democracy on income.

KEYWORDS: Democracy, corruption, income, principal component analysis, sub-Saharan Africa.

1. INTRODUCTION

Under endogenous growth models, economic performance is as a result of the contribution to aggregate output from introduction of new technology as well as governance and structural reforms. Governance reforms that enhance the quality of institutions provide effective mechanisms for accelerating economic performance and transform an economy from poverty to prosperity in the long term. Obviously, one of such governance reforms is democracy. Democracy provides an impetus for economic growth and income. A more democratic institution provides one of the channels of attracting foreign direct investments, foreign aid and above all redistribution of income and resources in favour of the poor and vulnerable in the economy. Additionally, democracy makes it possible for individuals to own property and wealth and establish businesses without any stringent restrictions. It is therefore not surprising that some existing studies have argued that democracy has a significantly positive impact on economic performance (example, Rigobon and Rodrik, 2005; Roll and Talbott, 2003; Rodrik, 2002; Sala-i-Martin, 2002). Notwithstanding, other studies obtained statistically negative relationship between democracy and economic performance (see Sakyi, 2011; Baum and Lake, 2003; Kurzman *et al.*, 2002; Helliwell, 1994).

To the extent that democracy has a significantly positive effect and fosters economic activities, democracy would have positive impact on income. If democratic institutions suffer from inefficiencies in making decisions resulting in difficulty in implementing crucial policies (especially in developing countries) democracy would undermine economic performance and hence income. Thus, research on democracy-income nexus is still far from a conclusive one. This could be due to the fact that there are several proxies for democracies and each of them affects income in different ways. It is in this regard that this study contributes to the literature. In this study, we present evidence from a large panel of countries in sub-Saharan Africa over the period 2002–2012. We also extend the basic democracy-income model to include several democracy indicators. We of course recognise potential multicollinearity of including more than one indicator of democracy in a single equation. We therefore apply the principal component analysis to reduce the dimension of the democracy indicators and estimate the impact of democracy in separate models.

Indeed, for the past three decades, democracy has become very important in sub-Saharan African. The political systems of sub-Saharan African countries have become democratised. Hitherto, democracy was almost not in existence since many obstacles undermined democratisation. As argued by Fosu (2008), the importance of democracy became apparent in sub-Saharan Africa at the beginning of 1990 as democracy was anticipated would enahnce the poor economic performance that had bedeviled the sub-region for decades. On the other hand, Africa is widely considered among the most corrupt regions in the world. This situation is

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seen as a contributory factor to the poor economic performance and impoverishment of many countries on the continent. In fact, six out of the top ten corrupt countries in the world are found in Africa (Transparency International, 2013). A study undertaken by African Union in 2002 revealed that approximately US$150 billion in the SSA sub-region is lost through corruption. In contrast, foreign aid and assistance inflows from western countries to sub-Saharan African region amounted to about US$22.5 billion according to the Organization for Economic Cooperation and Development (OECD, 2008). It is in regard that African leaders and governments have to institute measures to fight corruption rather than depending on foreign aid.

As noted earlier, while large body of studies find democracy to have positive and significant effect, others find negative effect. For example, Roll and Talbott (2003) investigated the link between democracy and gross national income per capita for between 134 and 157 countries over the period 1995–1999. Using political rights and civil liberties as measures of democracy, their study found a statistically significant positive relationship between democracy and gross national income per capita. Kaufmann *et al*. (1999) also found empirical evidence to support the positive relationship between democracy (proxied by voice and accountability) and economic growth. Adding to the already existing studies, Boko (2002) examined the link between democracy and growth for 27 African countries and concluded that democracy has a significant positive effect on growth. However, Veiga and Aisen (2011) find the relationship between democracy and income over the period 1960–2004 for 169 countries. Using, GMM estimation techniques, they found that democracy has a slightly negative impact on per capita income. Other studies that found negative effect include Baum and Lake (2003), Kurzman *et al*. (2002), Helliwell (1994) and Olson (1993).

Furthermore, studies in the extant literature have concluded that corruption adversely affect economic growth. These studies individually and collectively argue that corruption coupled with long and unnecessary bureaucratic procedures have the tendency to drive away potential investors, donor support, among others which consequently affect growth negatively. Corruption has the tendency to restrict the success of small, medium and large scale business which limit their ability to grow and become job and income generating. It leads to higher costs while providing inferior infrastructure projects, declining economic efficiency and macroeconomic challenges. According to Aidt *et al*. (2005) corruption reduces productivity growth through two mechanisms. First, corruption negatively affects innovation. Secondly, corruption reduces learning-by-doing externalities which inhibit possibilities of utilizing existing technology developed by other countries. In investigating the effect of corruption on product growth Lambsdorff (2003) concluded that corruption-growth relationship is manifested in the poor quality of the bureaucratic system. Other studies that obtained negative relationship between corruption and growth are Akcay (2006), Drury *et al* (2006), Mauro (2004), Mauro (2004), Bardhan (1997) and Mauro (1995).

The preceding discussions reveal three major conclusions. First, sub-Saharan African countries have democratized their political systems since 1990 to help promote economic growth and income. At the same time, corruption has become prevalent in SSA which has cost the sub-region several billions of US dollars. Secondly, it reveals that the empirical evidence on the impact of democracy on income is still far from a conclusive one, a situation that can be attributed to many factors. Thirdly, it shows that corruption in a country especially in developing countries increases the levels of poverty and income inequality which inhibit the economic growth and performance of the sub-region. Given these conclusions, there is still more room for further research with respect to the democracy-income nexus especially in sub-Saharan Africa. The isolation of the SSA sub-region from other developing regions in this study will inform a more explicit policy implication from the findings particularly as SSA countries are similar in economic characteristics.

This study thus contributes significantly to literature in several ways. First, we acknowledge that no single indicator can sufficiently proxy for democracy and therefore considers several alternative proxies to measure democracy and not just one as exist in the previous studies. Secondly, we also apply the principal component analysis to reduce the dimension of the democracy indicators to avoid the potential of multicollinearity problem of including more than one proxy in a single equation. Thirdly, we also include in our specifications country specific effects to remove the impact of specific country characteristics on economic growth that could correlate with democracy. Fourthly, we extend the basic democracy-income model to include corruption to account for the level of inefficiencies in the governance process and how it affects income. Finally, we include in our model the interaction between democracy and corruption to account for the extent to which increased democratization can reduce the incidence of corruption to spur economic growth.

It was eventually found in this paper that corruption has had negative and significant impact on income revealing the weaknesses in the institutional set up of many sub-Saharan African countries. Additionally, the overall effect of democracy on income depends on the choice of democracy indicator. While Property rights and political stability were found to have statistically positive effect on income, rule of law and government effectiveness have significantly negative effect on income.

The rest of the paper is arranged as follows: Section 2 describes the empirical methodology with emphasis on the data set, model specification and estimation techniques. The empirical results of the various estimation techniques as well as discussions are presented in detail in Section 3. The last section concludes the paper.

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2. EMPIRICAL METHODOLOGY

2.1 Description of Data

In all, the panel data consist of 32 sub-Saharan African countries[1] over the period 2003–2018. The selection of countries and time period was influenced by data availability for all the variables considered in the study.

The data used in the study were selected from different sources. In this study, we consider eight (8) alternative indicators to measure democracy. All the indicators were grouped into three. The first group of indicators of democracy consists of Polity5 which was obtained from Polity V Project. Polity5 is a continuous variable that measures the democratic quality of political regimes using polity scores; it ranges from -10 (strongly autocratic) to +10 (strongly democratic). It is worth emphasizing that Polity scores are derived from other measures such as competitiveness of executive recruitment, openness of executive recruitment, regulation and competitiveness of participation.

The second group of indicators of democracy consists of rule of law, government effectiveness, voice and accountability and political stability/no violence. Rule of law relates to the perceptions about the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. The next indicator of democracy in this group is government effectiveness which reflects perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Voice and accountability measure of democracy relates to the perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media. The last indicator of democracy in this group is Political stability/No violence which reflects the perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism.

The last group of indicators of democracy include: (i) Property rights which is an assessment of the ability of individuals to accumulate private property, secured by clear laws that are fully enforced by the state. It thus measures the degree to which a country's laws protect private property rights and the degree to which its government enforces those laws. (ii) Investment freedom which evaluates a variety of restrictions that are typically imposed on investment. (iii) Business freedom which reflects the ability to start, operate, and close a business that represents the overall burden of regulation as well as the efficiency of government in the regulatory process. These indices were obtained from the Index of Economic Freedom.

In order to make all the indicators in the various groups comparable, all the eight indicators namely Polity2, rule of law, government effectiveness, voice and accountability, political stability/no violence, property rights, investment freedom and business freedom were converted to $0 - 10$ scale with 0 representing full autocracy and 10 corresponding to full representative democracy. It is significant to mention that the first two groups of indicators measure political democracy while the third group of indicators measures economic democracy. It is also worth emphasising that these four alternative measures of democracy may be highly correlated. However, they measure different dimensions of the political and economic systems and as such it is expected that they have completely different and independent impact on economic growth.

2.2 Empirical Strategy and Estimation Technique

Basically, this paper utilizes dynamic panel techniques. The specific equation to be estimated takes the following form:

$$y_{it} = \delta + \gamma y_{it-1} + \theta_1 DEMO_{it} + \theta_2 COR_{it} + \theta_3 \left(DEMO*COR_{it} \right) + \beta'X_{it} + \lambda_i + \varepsilon_{it} \quad \text{...............} \quad (1)$$

where i = 1, 2, 3, ..., N is the cross-sectional dimension of countries, t = 1, 2, 3,....., T represents time, y_{it} is the logarithm of real GDP per capita (i.e. income), y_{it-1} is the logarithm of real GDP per capita at the beginning of each period which allows for a convergence situation across countries, $DEMO_{it}$ is the democracy variable, COR_{it} is the corruption variable, $DEMO*COR_{it}$ is the interaction between democracy and corruption, X_{it} is the set of control variables, λ_i represents the unobserved individual or country specific fixed effect, ε_{it} is the error term.

In this paper, the key variables of interest are democracy and corruption as well as their interaction term. Democracy enhances stable political environment, fundamental civil liberties and open society; promotes property protection, business freedom, as well as contract enforcement. All these are expected to foster economic activities which translate into income. Thus, a greater democratization should therefore raise level of income. Corruption on the other hand erodes part of the proceeds obtained by investors and entrepreneurs which reduces investor confidence and hence discourages investment. It results in loss of tax revenue by government, leads to inferior public infrastructure and services. These adversely affect economic performance resulting in decline in income. In effect, corruption is anticipated to produce a negative effect on income. The inclusion of the

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interaction term results from the fact that a strong democracy is expected to make political institutions and for that matter the process of governance more transparent and accountable. This reduces the level of inefficiency in the allocation of resources (that is, corruption) which is expected to culminate in overall improvement in economic performance.

In addition to democracy and corruption, the model contains control variables namely, foreign direct investment, capital stock, inflation and trade openness to control for other factors which can affect income.

Having specified the model for the study and explained the variables contained in it, we proceed to describe the technique adopted for estimation. This study basically adopts both the within-group (WG) and system Generalized Method of Moment (GMM) estimators to estimate the model specified in equation (1). The choice of these estimators was influenced by the fact that the dataset has a short time dimension (T = 16) and a larger country dimension (N = 32). This therefore makes the use of other panel data analysis like cointegration impossible. Besides, the within-group and the system GMM estimators are capable of accounting for individual country specific effects.

As noted earlier, this study uses dynamic panel data. This implies that the lagged dependent variable is likely to be correlated with the error term in the model. In such a situation, estimating equation (1) using ordinary least square (OLS) results in inefficient and biased estimates. In order to treat this problem and use OLS to estimate the model, the within-group estimator is applied to transform equation (1) by differencing the time series means of each variable for each country.

$$y_{it} - \bar{y}_t = \gamma\left(y_{it-1} - \bar{y}_i\right) + \theta_1\left(DEMO_{it} - \overline{DEMO_i}\right) + \theta_2\left(COR_{it} - \overline{COR_i}\right) +$$
$$\theta_3\left(DEMO*COR_{it} - \overline{DEMO*COR_i}\right) + \beta'\left(X_{it} - \overline{X}_i\right) + \left(\varepsilon_{it} - \bar{\varepsilon}_i\right) \quad \text{.......................} \quad (2)$$

From equation (2), though differencing the time series means of the variables eliminates the individual country-specific effects, λ_i because it does not vary with time, the correlation between $\left(y_{it-1} - \bar{y}_i\right)$ and $\left(\varepsilon_{it} - \bar{\varepsilon}_i\right)$ still remains. This again renders the within-group estimator biased and inconsistent. Thus, in order to deal with this problem, the first-differenced GMM attributable to Arrelano and Bond (1991) is used. This estimator uses lagged level of the dependent variable and other endogenous regressors as instruments for the first-differenced equation given in equation (3) below.

$$y_{it} - y_{it-1} = \gamma\left(y_{it-1} - y_{it-2}\right) + \theta_1\left(DEMO_{it} - DEMO_{it-1}\right) + \theta_2\left(COR_{it} - COR_{it-1}\right)$$
$$+ \theta_3\left(DEMO*COR_{it} - DEMO*COR_{it-1}\right) + \beta'\left(X_{it} - X_{it-1}\right) + \left(\varepsilon_{it} - \varepsilon_{it-1}\right) \quad \text{.................} \quad (3)$$

Equation (3) provides consistent and efficient estimates since it is able to remove the time invariant effects and also the past values are lagged more than two periods as valid instruments. Notwithstanding, when the dependent variable is highly persistent, the Differenced GMM could be biased and inefficient. In the light of this, it becomes essential to use the system GMM which provides consistent and efficient estimates. The system GMM as proposed by Blundell and Bond (1998) is derived from estimating two simultaneous equations, one in levels (with lagged first differences as instruments) and the other in first-differences (with lagged levels as instruments).

3. DISCUSSION OF RESULTS

The discussion of the empirical results begins with the results of the principal component analysis. It is then followed by the results of the two estimators used in the paper namely, the within-mean and the system GMM.

3.1 Principal Component Analysis

This study considers eight alternative indicators for democracy of which none can solely serve as an adequate indicator for democracy. Thus, to reduce the dimension of the democracy indicators and avoid the potential multicolinearity problem of including more than one proxy in a single equation, we apply principal component analysis to create four sub-indexes from the eight alternative indicators.

Tables 1A and 1B present the results of the principal component analysis out of which the four indexes were created. Table 1A lists the eigen values of the correlation matrix ordered from largest to smallest while Table 1B lists the associated eigen vectors or scoring coefficients. The eigen values indicate the variances of the principal components. From Table 1A, the variance for the first principal component is 4.479 explaining 56% of the total variance. The second principal component has a variance 1.238 (also explaining 15.5% of the total variance). The third and fourth principal components explain about 9% and 7% respectively. In effect, it can be seen that 88% of the total variance in the original data are accounted for by the first four principal components. This implies that the dimension of the democracy indicators has been reduced by half while preserving 88% of the information

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contained in the original data. Again, it is significant to mention that all the sub-indexes created are uncorrelated (orthogonal) and as a result can be included in a single equation.

From Table 1B, using a scoring coefficient of 0.3 or higher to determine the significance of factor score, it could be seen that the first principal components denoted as DEMOIndex1 include property rights (PR), polity2 (Polity2), voice and accountability (VA), political stability and no violence (PS), government effectiveness (GE) and rule of law (RL).

Similarly, the second principal components (*DEMOIndex2*) represents investment freedom (IF) and business freedom (BF). Further, the third principal components (*DEMOIndex3*) represents polity2 (Polity2) and political stability and no violence (PS). Finally, the fourth principal components (represented by DEMOIndex4) is made up of property rights (PR), investment freedom (IF), business freedom (BF) and political stability (PS).

Table 1A. Principal Component/Correlation

Principal component	Eigenvalues	Proportion (%)	Cumulative (%)
1	4.479	0.560	0.560
2	1.238	0.155	0.715
3	0.752	0.094	0.809
4	0.596	0.075	0.883
5	0.486	0.061	0.944
6	0.287	0.036	0.980
7	0.088	0.011	0.991
8	0.073	0.009	1.000

Table 1B. Eigenvectors (Scoring coefficients)

Component variable	1	2	3	4	5	6	7	8
Property rights	0.358	−0.167	0.178	0.330	0.722	0.409	−0.121	0.013
Investment freedom	0.185	0.650	0.297	0.593	−0.308	0.058	0.066	0.021
Business freedom	0.185	0.686	−0.089	−0.522	0.420	−0.185	−0.066	0.013
Polity2	0.318	0.070	−0.803	0.087	−0.144	0.335	0.209	0.256
Voice & account.	0.445	−0.073	−0.189	0.022	−0.199	−0.125	−0.486	−0.684
Political stability	0.358	−0.060	0.406	−0.494	−0.379	0.521	−0.090	0.190
Government effect.	0.427	−0.197	0.053	0.096	−0.048	−0.570	−0.278	0.602
Rule of law	0.440	−0.164	0.157	−0.075	0.027	−0.267	0.782	-0.257

Having created the principal components, the next step is to estimate the model. The results obtained by applying the within-group estimator are shown in Table 2A.

In model 2(a) the results show that corruption has negative and significant impact on income in sub-Saharan Africa. Thus, a percentage increase in corruption results in 0.068 percent decrease income in SSA. Corruption is indeed endemic in virtually all SSA countries. The inefficiencies in the various institutions coupled with the fact that the independence and professionalism of the public and private sectors have been eroded have resulted in widespread corruption, a situation which has been disadvantageous to levels of income. This result is consistent with theoretical and empirical expectations (Aidt *et al*, 2008; Akcay, 2006; Drury *et al*, 2006; Mauro, 2004).

Individually, two of the four key democracy proxies (with higher scoring coefficients) namely property rights and political stability showed positive and significant impact on income while the other two proxies (that is, rule of law and government effectiveness) showed negative and significant impact on income. One thing worth noting is that the magnitudes of these impacts were quite small.

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Table 2A. Democracy, Corruption and Income: Within-group Estimation

Variable	(1a)	(2a)	(3a)	(4a)	(5a)	(6a)	(7a)	(8a)
Log(FDI)	0.090	0.092	0.087	0.091	0.091	0.091	0.092	0.092
	(6.29)***	(5.64)***	(5.44)***	(5.74)***	(5.87)***	(5.75)***	(5.77)***	(5.84)***
Log(CAP)	0.007	0.004	0.005	0.007	0.007	0.021	0.022	0.017
	(3.84)***	(4.06)***	(4.82)***	(4.47)***	(4.63)***	(5.38)***	(6.15)***	(4.66)***
INFL	-0.001	-0.009	-0.008	-0.005	-0.001	-0.007	-0.008	-0.0001
	(-3.95)***	(-3.41)***	(-3.64)***	(-3.43)**	(-3.68)***	(-3.57)**	(-3.64)***	(-2.37)**
OPEN	-0.002	-0.0002	-0.0005	-0.001	-0.0010	-0.002	-0.002	-0.008
	(-1.45)*	(-0.97)	(-0.063)	(-1.24)*	(-0.98)	(-0.96)	(-0.97)	(-1.31)*
COR	-0.068							
	(-3.45)***							
PR		0.034						
		(4.25)***						
RL			-0.079					
			(-1.69)**					
PS				0.051				
				(2.24)**				
GE					- 0.012			
					(-1.08)*			
DEMOIndex1						0.188	0.147	0.079
						(2.84)**	(2.63)**	(1.34)*
DEMOIndex2						0.205	0.102	-0.007
						(2.96)***	(2.41)**	(5.75)**
DEMOIndex3						0.021	0.365	-0.148
						(1.98)**	(1.76)***	(-1.97)
DEMOIndex4						-0.040	-0.499	-0.031
						(-2.96)**	(-3.48)**	(-3.02)**
Interaction	0.005	-0.168	0.006	-0.260	0.007	0.002	0.008	-0.008
	(2.01)**	(-1.20)*	(1.04)	(-1.91)	(2.58)*	(1.02)	(1.52)	(-2.55)
ln$GDPC_{t-1}$	0.886	0.890	0.892	0.889	0.890	0.893	0.891	0.885
	(6.83)***	(6.87)***	(6.88)***	(6.79)***	(6.86)***	(6.91)***	(6.90)***	(6.92)***

***denotes significance at 1% level, ** denotes significance, 5% level,   * denotes significance at 10% level.

The *t*-statistics are provided in parentheses

Dependent variable is the log of GDP per capita. Interaction refers to the interaction of corruption with property rights, rule of law, political stability, government effectiveness as well as the indexes of the first, second, third and fourth principal components.

The coefficient of property rights (PR) in model 2(a) is 0.034 and is statistically significant at 1% level. The coefficient of rule of law (RL) is also -0.079 and significant at 5 percent level of significance. Political stability (PS) which also showed positive impact at 5 percent significance level had a coefficient of 0.051. Government effectiveness in model 5(a) had a coefficient of –0.012 which is statistically significant at 10 percent.

Clearly, apart from government effectiveness and rule of law, the other proxies meet a priori expectations and are also consistent with theory. For example, in model 2(a), a percentage increase in property rights results in a 0.034 percentage increase in income. This implies that if individuals are allowed to own properties and wealth without any restriction, it can lead to economic growth. In model 3(a) one percentage point increase in rule of law reduces income per capita by 0.079 per cent. Thus, rule of law has negative significant impact on income in SSA. This result is contrary to a priori expectation as rule of law is expected to promote economic activities and hence income. This result is however not surprising in the light of the numerous weaknesses in the institutional structure of many SSA countries. Institutions such as the judiciary and legislature are ineffective, hence rule of law is not strictly denforced. In model 4(a) increase in political stability by one percentage point will cause income to increase by 0.051 per cent. This means that in a politically stable environment where there is no violence, terrorism, among others, sustained

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economic performance could be achieved. Violence, terrorism, conflicts, coup d'états and other forms of instabilities create tension and insecurity in an economy which among other things, drive away current and potential investors, slow down economic activities, resulting in low economic performance. Indeed, over the period considered for the study, SSA countries had enjoyed considerable amount of political stability resulting in higher investor confidence to do businesses.

Contrary to a priori expectation, a percentage increase in government effectiveness results in a fall in income by 0.012. What this means is that governments have not been effective and efficient in achieving sustained income levels in SSA. This is reflected in the low quality of policy formulation and implementation coupled with lack of commitment on the part of governments to such policies.

With respect to the indexes created from the principal component analysis, the coefficient of the index created from the first principal component (DEMOIndex1) are positive and marginally in all the three specifications especially in model 8(a). The semi-elasticity of this index are respectively 0.188, 0.147 and 0.079 in models 6(a), 7(a) and 8(a). Hence, an increase in DEMOIndex1 by 1% point raises income by 0.188%, 0.147% and 0.079% in models 6(a), 7(a) and 8(a) respectively. This implies that the interactive effect of property rights, rule of law, political stability and government effectiveness produce a significant impact on income in SSA.

DEMOIndex2 which is the index created from the second principal component had positive and significant coefficients in models 6(a) and 7(a). However, in model 8(a), it has negative coefficient which is statistically significant as well. Thus, the interactive effects of the variables constituting this index yield a positive income effect in models 6(a) and 7(a) but negative impact in model 8(a). In this index, the coefficients are 0.205, 0.102 and –0.007 in models 6(a), 7(a) and 8(a) in that order. Therefore, a one percentage point increase in DEMOIndex2 causes income per capita to rise by 0.205 per cent in model 6(a), and 0.102 per cent in model 7(a).

In much the same way, the index created from the third principal components (represented by DEMOIndex3) recorded positive and significant estimates in models 6(a) and 7(a) but negative and insignificant estimate in model 8(a). The estimated semi-elasticities are correspondingly 0.021 and 0.365 in models 6(a) and 7(a). Therefore, when DEMOIndex3 increases by one percentage point, it causes real GDP per capita to increase marginally by 0.02 (model 6(a)) and 0.365 (model 7(a)). DEMOIndex4 which represents the index created from the fourth principal components produced coefficients which were negative and statistically significant at 5% level in all three models.

The interaction terms showed positive and significant impact on income per capita in five out of the eight specifications. Thus, the positive income effects of democracy in these models outweigh the negative income effects of corruption in these specifications. However, the interaction between rule of law and corruption (in model 2(a)), government effectiveness and corruption (in model 4(a)) as well as the interaction between DEMOIndex4 and corruption (in model 8(a)) yielded negative impact on income. This clearly is an indication of the extent to which corruption has engulfed government machinery and institutional structure of most sub-Saharan African hence, making them fragile and ineffective. Nonetheless, it can be said that a strong democratization could be a catalyst for reducing corruption which in turn could enhance economic performance in SSA as seen in most of the specifications.

As regards the control variables, the results are significantly consistent with economic theory and empirical literature with the exception of trade openness which persistently had negative coefficients which were not statistically significant except in three specifications where it was marginally significant at 10%.

Foreign direct investment and gross domestic capital formation (a proxy for capital stock) maintained positive and statistically significant impact on income in SSA. However, the magnitudes of the effects (measured by the coefficients) were quite small. Inflation recorded a negative and significant impact on income in all specifications as postulated in economic literature. This implies that inflation which in many macroeconomic literatures measures the extent of macroeconomic instability is injurious to economic performance in SSA. Trade openness showed a negative impact on income, albeit not statistically significant in five out of the eight specifications.

Democracy as used in this study is a composite variable which makes it endogenous. It therefore becomes imperative to control for any possible endogeneity hence, the adoption of the System-GMM estimator in this study. The results obtained from this estimator are presented in Table 2B. The results of the Sargan test showed that the instruments were generally valid. The serial correlation tests (AR (1) and AR (2) tests)) indicated that the errors in the levels were not serially correlated hence there is no significant first order serial correlation and second order serial correlation. Overall, the results obtained from this estimation are not significantly different from that of the within-mean in terms of a priori signs and expectations.

The coefficient on corruption is still negative and significant at 5% level. The results indicate that a one percentage point increase in corruption reduces income by 0.018 per cent. Corruption creates disincentive to invest, leads to poor public

infrastructure, increases cost of production, among others. All these culminate into low economic performance which reduces income levels.

Property rights and political stability and no violence maintained their positive income effects in SSA though the effect of property rights was marginal (at 10% level of significance). Government effectiveness and rule of law still exert negative impact (at 5% significance level) on income in SSA confirming the perceived inefficiencies in the entire government set up in many SSA countries.

Table 2B. Democracy, Corruption and Income: System-GMM Estimation

Variable	(1b)	(2b)	(3b)	(4b)	(5b)	(6b)	(7b)	(8b)
Log(FDI)	0.036	0.040	0.038	0.042	0.039	0.047	0.042	0.028
	(3.31)***	(3.89)***	(2.94)**	(4.14)***	(3.18)***	(3.30)***	(3.08)***	(2.83)**
Log(CAP)	0.002	0.003	0.003	0.002	0.013	0.009	0.010	0.005
	(4.03)***	(5.29)***	(5.73)***	(4.16)***	(5.84)***	(4.96)***	(5.13)***	(5.62)***
INFL	-0.012	-0.015	-0.009	-0.012	-0.002	-0.006	-0.007	-0.005
	(-2.43)***	(-1.75)***	(-1.87)***	(-2.27)**	(-1.13)***	(-1.73)**	(-1.02)***	(-1.02)**
OPEN	-0.002	0.001	0.002	0.003	0.002	0.008	-0.006	-0.003
	(-1.49)*	(1.02)	(1.68)*	(1.86)**	(1.34)*	(1.79)*	(-1.91)	(-1.82)*
COR	-0.018							
	(-1.99)**							
PR		0.071						
		(1.96)*						
RL			-0.037					
			(-3.25)***					
PS				0.032				
				(3.98)***				
GE					-0.186			
					(-2.64)**			
DEMOIndex1						0.012	0.094	0.047
						(3.44)**	(2.86)**	(1.93)*
DEMOIndex2						0.030	0.039	0.056
						(2.61)**	(1.97)*	(1.88)*
DEMOIndex3						0.040	-0.011	-0.080
						(1.24)**	(-3.39)***	(-2.47)**
DEMOIndex4						0.011	0.046	0.058
						(1.82)*	(1.19)	(1.75)*
Interaction	0.015	-0.064	0.017	-0.028	0.011	-0.012	-0.008	0.020
	(1.93)*	(-1.76)*	(3.43)***	(-2.15)**	(1.76)*	(-1.04)	(-0.98)	(1.08)
lnGDPC$_{t-1}$	0.926	0.928	0.953	0.951	0.958	0.962	0.950	0.947
	(7.21)***	(7.25)***	(7.41)***	(7.41)***	(7.43)***	(7.49)***	(7.38)***	(7.37)***

***denotes significance at 1% level, ** denotes significance at 5% level,   * denotes significance at 10% level.

The *t*-statistics are provided in parentheses

Dependent variable is the log of GDP per capita. Interaction refers to the interaction of corruption with property rights, rule of law, political stability, government effectiveness as well as the indexes of the first, second, third and fourth principal components. The results included the Sargan test for the overall validity of the instruments as well as the AR(1) and AR(2) tests for first and second-order correlation but were not reported.

Considering the indexes created from the principal components, DEMOIndex1, DEMOIndex2 and DEMOIndex4 all showed marginally positive impact on income in all three specifications. DEMOIndex3 affects income negatively in models 7(b) and 8(b) while it had positive effect in model 6(b). The impact of the interaction between rule of law, government effectiveness, DEMOIndex2, DEMOIndex3 and corruption on income was negative. On the other hand, the coefficient on the interaction between property rights, political stability, DEMOIndex1 and DEMOIndex4 was positive.

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Among the control variables, foreign direct investment and capital still had positive and significant impact on income in SSA in all specifications. Once again, the magnitude of their effect is still small. Inflation also continues to negatively affect income in all the models. Trade openness alternates in signs and impact depending on a particular specification.

4. CONCLUSION AND POLICY IMPLICATIONS

This study aimed at investigating the impact of democracy and corruption on income for a panel of 32 countries in sub-Saharan Africa. The results show that whether or not democracy has income effect depends on a particular indicator used. Thus, the overall effect of democracy on income depends on the choice of democracy indicator. This is further confirmed by the indexes created from the principal component analysis. While property rights and political stability have had positive income effects government effectiveness and rule of law have shown negative impact on income. Among the control variables, foreign direct investment and capital stock have contributed significantly to income while inflation has been detrimental to income. The results and for that matter the findings mentioned above have important policy and research implications. Governments must incorporate anticorruption measures in their development strategies. Such measures should include the private sector in the implementation of anti-corruption strategies. Also, businesses must also endeavour to eliminate corruption in their transactions, by keeping bribery out of the procurement and bidding processes while reducing extortion. Public opinion as well as community members' involvement must support anticorruption strategies to create an environment where corruption is not accepted or condoned. Again, policy reforms should target programmes that seek to develop and build the capacities of judiciaries, legislatures, media and civil societies to help enforce rule of law and strengthen democratic institutions. Furthermore, governments and policy makers in SSA must seek to reduce macroeconomic instability by targeting relatively low inflation rates that promote economic growth. Finally, for research, the results obtained in this study suggest that one should seriously take into account the selection of proxies when investigating the impact of democracy on economic performance.

Note

1. Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Democratic Republic of Congo, Republic of Congo, Cote d'Ivoire, Ethiopia, Gabon, Ghana, Guinea, The Gambia, Guinea-Bissau, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Swaziland, Togo, Zambia and Zimbabwe.

REFERENCES

1) Abed, G. T., and Davoodi, H. R. *Corruption, Structural Reforms, and Economic Performance in the Transition Economies*, Working Paper No. 132, International Monetary Fund, Washington D.C., 2000

2) Aidt, T., Dutta, J., and Sena, S. *Growth, governance and corruption in the presence of threshold effects: Theory and Evidence*, Cambridge Working Papers in Economics, No. 0540. 2005

3) Akçay, S. *Corruption and Human Development*, Cato Journal, Vol. 26 No.1, pp 29–46. 2006

4) Arellano, M., and Bond, S. *Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations*, The Review of Economic Studies, Vol. 58 No. 2, pp. 277–297. 1991

5) Baltagi, B.H. *Econometric Analysis of Panel Data*, 2nd Edition. New York: Wiley & Sons. 2001

6) Blundell, R., and Bond, S. *Initial Conditions and Moment Restrictions in Dynamic Panel Data Models*, Journal of Econometrics, Vol. 87, No. 1, pp. 115-143. 1998

7) Boko, S.H. *Economic reform, democracy, and economic growth in Africa: An institutional approach*, International Advances in Economic Research, Vol. 8 No. 3, pp. 264–281. 2002

8) Comeau, L. *Democracy and growth: A relationship revisited*, Eastern Economic Journal, Vol. 29 No. 1, pp. 1–21. 2003

9) Doucouliagos, H., and Ulubasoglu, M. *Democracy and economic growth: A meta-analysis*, American Journal of Political Science, Vol. 52 No. 1, pp. 61–83. 2008

10) Drury, C. Krieckhaus, J. and Lusztig, M. *Corruption, Democracy, and Economic Growth*, International Political Science Review, Vol. 27 No. 2, pp. 121–136. 2006

11) Fosu, A.K. *Democracy and growth in Africa: Implications of increasing electoral competitiveness*, Economics Letters, Vol. 100, No. 1, pp. 442–444. 2008

12) Freedom House *Freedom in the World Country Ratings*, 1972-2012. 2020

13) Heckelman, J. *The connection between democratic freedoms and growth in transition economies*, Applied Economics Quarterly, Vol. 56, No. 1, pp. 121–146. 2010

14) Helliwell, J.F. *Empirical linkages between democracy and economic growth*, British Journal of Political Science, Vol. 24, No. 2, pp. 225–248. 1994

Democracy, Corruption and Income: Evidence from Sub-Saharan Africa

15) Kaufman, D., Kraay, A., and Mastruzzi, M. *The Worldwide Governance Indicators: A Summary of Methodology, Data and Analytical Issues*, Working Paper No. 5430, World Bank Policy Research. 2013

16) Lambsdorff, J. G. *The Institutional Economics of Corruption: Theory, Evidence and Policy.* Cambridge: Cambridge University Press. 2007

17) Marshall, M.G., and Gurr, T.R. *Polity V Project: Political regime characteristics and transitions, 1800–2018.* Center for Systemic Peace and Colorado State University. Retrieved from http://www.systemicpeace.org/polity/polity5.htm 2020

18) Minier, J.A. *Democracy and growth: Alternative approaches*, Journal of Economic Growth, Vol. 3 No. 3, pp. 241–266. 1998

19) Rose-Ackerman, S. When is Corruption Harmful?' Working Paper No. 64, World Bank Washington, DC.   1996

20) Roodman, D. *How to do xtabond2: An introduction to "Difference" and "System" GMM in Stata'*, Working Paper No. 103, Center for Global Development. 2006

21) Transparency International. *Corruption Perception Index*, Berlin: Transparency International. 2020

22) World Bank (2020). *World Development Indicators*, Washington, DC: World Bank.

23) World Bank (2020). *African Development Indicators,* Washington, DC: World Bank.