UNISA ECONOMIC RESEARCH WORKING PAPER SERIES

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Working Paper 26/2018

October 2018

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[1] This working paper also appears in the Development Bank of Nigeria Working Paper Series and the African Governance and Development Institute Working Paper Series.

GOVERNANCE AND SOCIAL MEDIA IN AFRICAN COUNTRIES: AN EMPIRICAL INVESTIGATION

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Abstract

This study assesses linkages between social media and governance dynamics in 49 African countries for the year 2012. The empirical evidence is based on ordinary least squares and quantile regressions. Ten bundled and unbundled governance dynamics are used, notably: (i) political governance (entailing "voice & accountability" and political stability/no violence); (ii) economic governance (involving regulation quality and government effectiveness); (iii) institutional governance (comprising the rule of law and corruption-control) and (iv) general governance (entailing political, economic and institutional governance). Social media is measured with Facebook penetration. The findings show that Facebook penetration is positively associated with governance dynamics and these positive nexuses differ in terms of significance and magnitude of significance throughout the conditional distribution of the governance dynamics.

Key words: Governance; Social media; Africa

JEL Classification: G20; O38; O40; O55; P37

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1. Introduction

The motivation of this study builds on three main factors, notably: (i) the growing importance of information and communication technology (ICT); (ii) the policy syndrome of poor governance in African development and (iii) gaps in the Facebook penetration literature. We discuss the points in chronological order[4].

First, while there is a growing strand of literature on the importance of ICT in development outcomes, this literature is also consistent with the view that, opportunities of ICT penetration are more apparent in Africa because more developed markets in North America, Europe and Asia have reached levels of saturation (Penard *et al*., 2012; Asongu, 2018; Afutu-Kotey *et al*., 2017; Tchamyou, 2017; Asongu & Boateng, 2018. Abor *et al*., 2018; Gosavi, 2018; Uduji & Okolo-Obasi, 2018a, 2018b). An implication is that the penetration potential in Africa can be leveraged to address glaring policy syndromes such as poor governance (Asongu *et al*., 2019).

Second, Africa's poverty tragedy of underdevelopment has been documented to be substantially linked to poor governance, *inter alia*: deinstitutionalization of the continent (Nunn & Puga, 2012); loss of traditional institutions (Lewis, 1955; Amavilah, 2016) and poor contemporary institutions (Adewole & Osabuohien, 2007; Efobi *et al*., 2013; Andrés *et al*., 2015; Oluwatobi *et al*., 2015; Ajide & Raheem, 2016a, 2016b). Despite the scant literature on the importance of ICT in institutional development in Africa (Snow, 2009; Mathias, 2012; Porter *et al*., 2015; Gagliardone, 2016; Asongu *et al*., 2019), the dimension of social media has not been explored. Building on these underpinnings, a strand of the literature has focused on assessing the importance of ICT in governance in Africa (Snow, 2009; Mathias, 2012; Porter *et al*., 2015; Gagliardone, 2016). Snow (2009) has established that a nexus exist between corruption and mobile phone penetration. According to Mathias (2012), accountability and openness are strongly increased through mobile connectivity. Porter *et al*. (2015) establish that increasing mobile phone penetration enhances participative governance from the youth. The relevance of radio-mobile interactions has been examined by Gagliardone (2016) who has concluded that such linkages improve government quality. Despite the scant literature on the importance of ICT in institutional development in Africa, the dimension of social media has been largely unexplored. This is essentially because of social media data availability constraints.

[4] Governance is used to imply good governance throughout the study.

Third, as far as we have reviewed, only three studies have examined the effects of Facebook penetration using macroeconomic data. The impact of social media on governing natural resources has been investigated by Kodila-Tedika (2018) whereas Jha and Sarangi (2017) have assessed the importance of social media in fighting corruption. The study has been extended by Jha and Kodila-Tedika (2018) who have examined whether democracy is promoted by social media. While the three studies above have concluded that social media respectively increases the governance of natural resources, reduces corruption and promotes democracy, two fundamental shortcomings are apparent in light of the discourse from the previous two strands, notably: (i) the findings provide global perspectives instead of African-centric results and (ii) one or two governance outcome variables are employed. In extending the literature, the present study fills the identified gaps by using quantile regressions to assess correlates between social media and ten governance dynamics in Africa. The governance dynamics consists of political stability/no violence, voice and accountability, political governance, government effectiveness, regulation quality, economic governance, corruption-control, the rule of law, institutional governance and general governance. The four governance variables consist of the other six governance indicators that are bundled through principal component analysis.

The interest of bundling governance variables builds on the fact that it is misleading to employ economic terms in the interpretation of economic phenomena unless such terms are substantiated with empirical validity. For instance, it is inappropriate to employ economic governance unless it entails both government effectiveness and regulation quality. Hence, four composite governance variables are considered, notably: (i) political governance (entailing "voice & accountability" and political stability/no violence); (ii) economic governance (involving regulation quality and government effectiveness); (iii) institutional governance (comprising the rule of law and corruption-control) and (iv) general governance (entailing political, economic and institutional governance). The underlying strategy of unbundling and bundling governance variables has been employed in recent literature in order to increase room for policy implications (Asongu & Nwachukwu, 2016a, 2017).

The importance of employing quantile regressions in an estimation strategy builds on the fact that correlates based on mean values of the governance dynamics may be ineffective unless they are contingent on existing values of governance dynamics and tailored differently across countries with varying levels of governance quality. In summary, by leveraging on a new social media dataset in order to contribute to the extant literature, this study also responds to growing calls for more scholarly research on the importance of information technology in development outcomes in developing countries (Whitacre *et al*., 2014 ; Jogernson & Vu, 2016;

Pradhan *et al*., 2014 ; Sujarwoto & Tampubolon, 2016; Muthinja, 2018; Minkoua Nzie, 2018; Tchamyou, 2018a, 2018b; Tchamyou *et al*., 2018; Tchamyou & Asongu, 2017; Hubani & Wiese, 2018; Issahaku *et al*., 2018;Bongomin *et al*., 2018; Efobi *et al*., 2018).

The rest of the study is organised in the following manner. Theoretical insights and testable hypotheses are discussed in section 2 while section 3 covers the data and methodology. Section 4 discloses the empirical results and corresponding discussion. We conclude in section 5 with implications and future research directions.

2. Theoretical insights and hypotheses development

Whereas the primary function of social media is not for policy exchanges, it can nonetheless influence policy development, especially in the area of governance. How facebook penetration can be related to governance and by extension policy development is discussed in this section. While no formal and universally accepted theoretical framework has been established on the nexus between ICT and governance, beyond the scope of theoretical foundations, it is relevant to articulate that theory-building can be enhanced by applied econometrics that is motivated by sound intuition in the light of arguments drawn from existing theoretical underpinnings. Within this analytical perspective, we are consistent with attendant literature in arguing that the scope of applied econometrics should not be limited exclusively to studies that reject or accept hypotheses founded on existing theoretical frameworks (Costantini & Lupi, 2005; Narayan *et al*., 2011). Moreover, for new phenomena (e.g. social media), theory-building empirical studies are also worthwhile. In what follows, the theoretical arguments for the testable hypotheses are discussed.

Consistent with Hellstrom (2008), governance can be enhanced with ICT in the perspective that it improves openness, transparency and the diffusion of information between, *inter alia*: various local government organs, government ministries, authorities and the civil society. In the light of the narrative, ICT can facilitate the involvement of citizens in decision-making processes that affect their political, economic and institutional landscapes. Such participative involvement is possible because ICT is consolidating the convergence of societies that are informative, participative and connected (Asongu *et al*., 2019).

With respect to Snow (2009), ICT is relevant in government effectiveness. According to the author, in the past, limited availability of ICT provided the elites with an opportunity to reap preferential benefits from privileged information which ultimately motivated poor governance. Such monopolistic detention of information facilitated poor conditions for transparency and accountability, which greased enabling conditions for corruption on the part of the elite detaining such privileged information. Snow (2009) further posits that the overall effect from the burgeoning diffusion of information in Africa has been a reduction in corrupt behavior on the part of the ruling elite. Hence, with the popularization of ICT, barriers that prevent the ruling elite from scrutiny are being broken and proper cost-benefit analyses pertaining to investments in the public sector are being enhanced. Whereas the underlying theory from Snow (2009) is oriented towards corruption-control (which is a dimension of institutional governance), the corresponding logic and arguments can however be extended to other dimensions of governance (political, economic and institutional).

First, on the nexus between political governance and social media, we argue that the latter promotes political stability/no violence as well as “voice and accountability”. This is essentially because social media could potentially coordinate the organization of protests of pacific nature which are aimed at urging authorities in place to display more openness and accountability towards citizens. Hence, a social media such as Facebook could be a measure by which to assess the ability of citizens to participate in the process of selecting their leaders for elected offices. Moreover, it could also be used to examine the freedom of association and expression enjoyed by the same citizens in mechanisms of universal suffrage that culminate in the election of officials.[5]

Looking at the dimension of political stability in political governance, we argue that though social media could also be used to promote civil unrests and terrorism, the overall benefits in mitigating violence and abuse of power by authorities in place (including the army and police) are favourable towards political governance. The arguments are plausible because citizens are growingly conscious of the negative consequences (especially in economic hardship) of undemocratic transition to power or unconstitutional mechanisms that entail domestic violence, terrorism, coup d’etats and overthrow of elected officials.

Hypothesis 1: The relationship between social media and political governance is positive because the former facilitates a free and fair election and replacement of political leaders.

Second, the channels through which social media usage enhances economic governance are: regulation quality and government effectiveness. Accordingly, the simplification and

[5]While it could also be argued that the process of electing officials by universal suffrage is not through social media, the information technology platform nonetheless helps in facilitating universal suffrage via enhanced communication and coordination.

expedition between departments of governments on the one hand and between citizens and government officials on the other hand, are necessary for enhanced participation and involvement in the design and implementation of economic measures.

Hypothesis 2: Social media positively affects economic governance by influencing the formulation and implementation of policies that deliver public commodities.

Third, institutional governance can be improved through more corruption-control and enhancement of the rule of law. The underpinnings of Snow (2009) discussed in the previous paragraphs are supportive of the intuition for a favourable relationship between social media and institutional governance. According to the narrative, ICT (and by extension social media) has improved the respect of the rule of law, mitigated corruption and increased transparency because it has been unfavourable to the monopoly and manipulation of privileged information for private gain by a few elite.

Hypothesis 3: The employment of social media favourably influencesinstitutional governance by enabling respect by the State and citizens of institutions that govern interactions between them.

In a nutshell, the testable hypotheses and the theoretical underpinings of Snow (2009) align in the perspective that when information is captured by a selected few and ruling elite, it becomes a sources of corruption and bad governance (institutional, economic and political). Therefore, the decentralisation of information through social media mitigates avenues for unhealtthy governance practices to take root. The motivation for this association is consistent with the strand ofliterature on the nexus between governance and ICT (Suarez, 2006; Boulianne, 2009; Diamond, 2010; Grossman *et al*., 2014; Asongu *et al*., 2019).

It is relevant to provide alternative arguments in order to balance the theoretical arguments discussed above. Accordingly, there is another strand of the literature which supports the view that information technology can reduce governance through collective action that is violent (Weidmann& Shapiro, 2015; Breuer et al., 2012; Manacorda & Tesei, 2016; Pierskalla & Hollenbach, 2013).Moreover, as noted by Morozov (2011), information technology can be used by incumbent governments to limit accountability and promote misinformation. According to Asongu et al. (2019), other factors that influence the negative nexus between information technology and governance include the additional cost of increasingly using information technology to collect information that is required to: organise political rallies and civil protests, request reforms for economic empowerment and hold the elite accountable.

In the light of the above, governments can use social media and mobile technologies to influence governance outcomes differently. Accordingly, some countries can place emphasis on political governance whereas others can be more concerned with economic governance. These distinct priorities depend on whether a country is sympathetic to the Beijing Model (which prioritises economic governance over political governance) or to the Washington Consensus (which prioritises political governance over economic governance). It is important to note that these are the two dominant models of contemporary development that are influencing development paradigms in African countries (Asongu & le Roux, 2018). As articulated by Asongu and Ssozi (2016), the Beijing Model can be defined as "*de-emphasised democracy, state capitalism and priority in economic rights*", whereas the Washington Consensus is "*liberal democracy, private capitalism and priority in political rights*". Political rights are consistent with political governance while economic rights are in accordance with economic governance.

3. Data and methodology

3.1 Data

The study focuses on a cross-section of 49 countries in Africa with data from Quintly (which is a social media benchmarking and analytics solution company)[6], African Development Indicators (ADI) and World Governance Indicators (WGI) of the World Bank for the year 2012. The geographical and temporal scopes are limited by data availability constraints.

The governance variables from WGI of the World Bank are consistent with Kaufmann et al. (2010). The six indicators from Kaufmann et al. (2010) are bundled by means of principal component analysis (PCA) to produce four more governance indicators, notably: (i) political governance (entailing "voice & accountability" and political stability/no violence); (ii) economic governance (involving regulation quality and government effectiveness); (iii) institutional governance (comprising the rule of law and corruption-control), and (iv) general governance (entailing political, economic and institutional governance). As clarified in section 3.2.1, some of the dependent variables are composite indices that combine qualitative indicators or variables using the PCA technique to develop the indices that are quantitative dependent variables.

Social media is measured with Facebook penetration data from Quintly. These data have been employed in a recent strand of literature on the importance of social media in institutional

[6] The data was accessed from its website (http://www.quintly.com/facebook-countrystatistics?period=1year).

outcomes (Jha &Sarangi, 2017; Kodila-Tedika, 2018; Jha & Kodila-Tedika, 2018).The fact that some of the papers using the Facebook indicator have been published is an indication of the quality of the Facebook penetration data.

Four main control variables are adopted in accordance with the governance literature, notably: domestic terrorism, primary school enrolment, Gross Domestic Product (GDP) per capita and aid to the production sector (Lederman *et al*., 2005; Cheung & Chan, 2008; Okada & Samreth, 2012; Asongu & Nwachukwu, 2016a, 2016b). With the exception of terrorism which has been documented by Asongu and Nwachukwu (2017) to reduce governance, we expect the remaining control variables to positively influence governance. According to Asongu and Nwachukwu (2016a, 2016b), economic prosperity is positively linked to governance while Okada and Samreth (2012) conclude on a positive aid-governance nexus. Asongu and Nwachukwu (2016c) have established that education and lifelong learning positively influence governance. This is consistent with the broad stream of literature on a positive education-governance nexus (Lederman *et al*., 2005; Cheung & Chan, 2008)

The definitions and sources of variables are disclosed in Appendix 1, whereas the summary statistics and sampled countries are provided in Appendix 2. In the light of the summary statistics, we notice that the averages of the variables are comparable. Moreover, given the corresponding standard deviations, we can be confident that reasonable estimated linkages will emerge.

3.2 Estimation technique

3.2.1Principal component analysis (PCA)

PCA is used to bundle the six governance variables into four composite indices, notably: political, economic, institutional and general dynamics of governance. This process of bundling governance indicators in order to increase the policy relevance of the empirical analysis is consistent with recent African development literature (Tchamyou, 2017; Asongu & Nwachukwu, 2016b). The PCA is a statistical method that is usually employed to reduce a set of highly correlated indicators into a smaller set of indices known as principal components (PCs). These PCs reflect the variations that are common to the constituent indicators.

In the light of the above, this research uses the Jolliffe (2002) and Kaiser (1974) criterion to derive common factors. This criterion requires that PCs with an eigenvalue that is higher than one should be retained. The corresponding PCA results which are disclosed in Table 1 show that all retained common factors have an eigenvalue of above one and represent at least 75% of common information or variability among the constituent indicators. Accordingly, general governance (*G.Gov*) has an eigenvalue of 4.837 with more than 80% of common information in the six constituting indicators. In the same vein, institutional governance (Instgov), economic governance (Econgov) and political governance (Polgov) have total variations of 92.20%, 93.80% and 78.60% and eigenvalues of 1.844, 1.876 and 1.572, respectively.

Table 1: Principal Component Analysis (PCA) for Governance (Gov)

Principal Components	Component Matrix (Loadings)						Proportion	Cumulative Proportion	Eigen Value
	VA	**PS**	**RQ**	**GE**	**RL**	**CC**			
First PC (G.Gov)	0.394	0.352	0.422	0.433	0.443	0.399	0.806	0.806	4.837
Second PC	0.421	-0.821	0.286	0.151	0.044	-0.206	0.082	0.888	0.496
Third PC	-0.541	-0.431	-0.084	0.226	0.074	0.676	0.059	0.948	0.356
First PC (Polgov)	0.707	0.707	---	---	---	---	0.786	0.786	1.572
Second PC	-0.707	0.707	---	---	---	---	0.213	1.000	0.427
First PC (Econgov)	---	---	0.707	0.707	---	---	0.938	0.938	1.876
Second PC	---	---	-0.707	0.707	---	---	0.061	1.000	0.123
First PC (Instgov)	---	---	---	---	0.707	0.707	0.922	0.922	1.844
Second PC	---	---	---	---	-0.707	0.707	0.078	1.000	0.156

P.C: Principal Component. VA: Voice & Accountability. RL: Rule of Law. R.Q: Regulation Quality. GE: Government Effectiveness. PS: Political Stability. CC: Control of Corruption. G.Gov (General Governance): First PC of VA, PS, RQ, GE, RL & CC. Polgov (Political Governance): First PC of VA & PS. Econgov (Economic Governance): First PC of RQ & GE. Instgov (Institutional Governance): First PC of RL & CC.

3.2.2 Ordinary Least Squares

A baseline ordinary least squares (OLS) empirical approach is adopted in the light of the cross-sectional nature of the dataset. The choice of this empirical strategy is also consistent with the attendant literature using the same data structure, notably: inclusive development (Andrés, 2006; Asongu & Odhiambo, 2017), financial development (Kodila-Tedika & Asongu, 2015) and ICT (Asongu, 2013a) studies.

Equation 1 below examines the correlation between social media and governance:

$$G_i = \alpha_1 + \alpha_2 SM_i + \alpha_3 X_i + \varepsilon_i \, , \qquad (1)$$

where G_i represents a governance dynamic ("voice & accountability", political stability/no violence, political governance, regulation quality, government effectiveness, economic governance, corruption-control, rule of law, institutional governance and general governance), whereas SM_i is the social media indicator for country i, α_1 is a constant, X is the vector of control variables, and ε_i the error term. X contains: domestic terrorism, primary school enrolment, GDP per capita and aid to the production sector.

3.2.3Quantile Regressions

The OLS modelling approach in the previous section is based on mean values of governance. Whereas these mean nexuses are relevant, complementing them with conditional nexuses is also worthwhile. The policy importance of such conditional relationships is motivated by the fact that mean-oriented estimates provide blanket implications for policy that may be ineffectiven unless they are contingent on initial levels of governance and tailored differently across countries with low, intermediate and high levels of governance.

In accordance with the underlying literature (Koenker & Bassett, 1978; Tchamyou & Asongu, 2018), the approach by quantile regressions (QR) is appropriate in emphasizing existing levels of an outcome variable in the estimation exercise. The QR is being increasingly adopted in scholarly circles in order to increase room for policy implications (Okada & Samreth, 2012; Asongu, 2013b). Moreover, consistent with Koenker (2005) and Hao and Naiman (2007), the QR differs from linear regressions from a plethora of perspectives, *inter alia*, it predicts conditional quantiles (versus conditional mean); needs sufficient data (versus an OLS approach when n can be small); follows an agnostic distribution (versus the assumption of normality); is robust to the response of outliers (versus sensitivity to outliers), and is computationally intensive (versus a linear approach which is computationally less intensive).

The θ^{th}quantile estimator of governance is obtained by solving for the following optimization problem, which is presented without subscripts in Eq. (2) for the purpose of simplicity and readability.

$$\min_{\beta \in R^k} \left[\sum_{i \in \{i: y_i \geq x_i'\beta\}} \theta \left| y_i - x_i'\beta \right| + \sum_{i \in \{i: y_i < x_i'\beta\}} (1-\theta) \left| y_i - x_i'\beta \right| \right], \qquad (2)$$

where $\theta \in (0,1)$. Contrary to OLS which is fundamentally based on minimizing the sum of squared residuals, with QR, the weighted sum of absolute deviations is minimised. For example, the 10^{th} or 25^{th} quantiles (with θ=0.10 or 0.25 respectively) are estimated by approximately weighing the residuals. The conditional quantile of governance or y_i given x_i is:

$$Q_y(\theta / x_i) = x_i'\beta_\theta \quad , \qquad (3)$$

where unique slope parameters are modelled for each θ^{th} specific quantile. This formulation is analogous to $E(y/x) = x_i'\beta$ in the OLS slope where parameters are examined only at the mean of the conditional distribution of governance. For Eq. (3), the dependent variable y_i is a governance dynamic whereas x_i contains: a constant term, domestic terrorism, primary school enrolment, GDP per capita and aid to the production sector.

In the light of the above, separate regression equations for the QR and OLS for each of the three investigated hypotheses are needed.

$$PG_{i,t} = \sigma_0 + \sigma_1 X_{i,t} + \varepsilon_{i,t} \quad (4)$$

$$PG_{i,t} = \sigma_0^{(p)} + \sigma_1^{(p)} \sigma_1 X_{i,t} + \varepsilon_{i,t}^{(p)} \quad (5)$$

The OLS and QR respectively in Equation (4) and Equation (5) above focus on the first hypothesis of testing the role of social media in political governance, where, $PG_{i,t}$ is political governance (consisting of "voice & accountability" and political stability/no violence) in country i at period t, σ_0 is a constant, X entails social media and other control variables (domestic terrorism, primary school enrolment, GDP per capita and aid to the production sector), and $\varepsilon_{i,t}$ is the error term.

$$EG_{i,t} = \lambda_0 + \lambda_1 X_{i,t} + \omega_{i,t} \quad (6)$$

$$EG_{i,t} = \lambda_0^{(p)} + \lambda_1^{(p)} \sigma_1 X_{i,t} + \omega_{i,t}^{(p)} \quad (7)$$

The OLS and QR respectively in Equation (6) and Equation (7) above focus on the second hypothesis of testing the role of social media in economic governance, where $EG_{i,t}$ is an economic governance variable (consisting of government effectiveness and regulation quality) in country i at period t, λ_0 is a constant, X entails social media and other control variables (domestic terrorism, primary school enrolment, GDP per capita and aid to the production sector), and $\omega_{i,t}$ is the error term.

$$IG_{i,t} = \phi_0 + \phi_1 X_{i,t} + \xi_{i,t} \quad (8)$$

$$IG_{i,t} = \phi_0^{(p)} + \phi_1^{(p)} \sigma_1 X_{i,t} + \xi_{i,t}^{(p)} \quad (9)$$

The OLS and QR respectively in Equation (8) and Equation (9) above focus on the third hypothesis of testing the role of social media in institutional governance, where $IG_{i,t}$ is an institutional governance variable (consisting of corruption control and the rule of law) in country i at period t, ϕ_0 is a constant, X entails social media and other control variables (domestic terrorism, primary school enrolment, GDP per capita and aid to the production sector), and $\xi_{i,t}$ is the error term.

4. Empirical results

The empirical results are presented in this section. Table 2 presents the relationship between social media and political governance, Table 3 shows the results between social media and economic governance, Table 4 is concerned with the nexuses between social media and institutional governance whereas Table 5 presents relationships between social media and general governance. From all the tables, it is apparent that estimates from the OLS are different from corresponding quantile estimates in terms of significance and magnitude of significance. This variation between OLS and QR estimates confirms the policy relevance of estimating nexuses throughout the conditional distribution of governance dynamics.

The following findings can be established from Table 2 on nexuses between social media and political governance. First, in Panel A on "political stability/no violence", the OLS estimate is not significant while the linkage is negatively significant in the 10^{th} quantile. Second, in Panel B on "voice and accountability", the OLS estimate is not significant whereas the estimates are positively significant with an S-shape from the 10^{th} to the 75^{th} quantile. Third, in Panel C on "political governance", the OLS estimate is not significant while the nexus is positively significant in the 25^{th} quantile. Fourth, the significant control variables display the expected signs.

The following findings can be established from Table 3 on nexuses between social media and economic governance. First, in Panel A on government effectiveness, the OLS estimate is positively significant while the QR estimates are significant in the 10^{th}, 25^{th} and 75^{th} quantiles. Second, in Panel B where regulation quality is the outcome variable, the OLS estimate is significant while quantile estimates are also significant with a U-shape from the 10^{th} to the 75^{th} quantiles. Third, in Panel C on "economic governance", the OLS estimate is positively significant whereas corresponding nexuses from quantiles are exclusively significant in the bottom (10^{th} and 25^{th} quantiles) and top (75^{th} and 90^{th}) quantiles.

The following results are apparent from Table 4 on linkages between social media and institutional governance. First, in Panel A on corruption control, the OLS estimate is not significant while the quantile regressions estimates are significant from the 10^{th} to the 50^{th} quantile in decreasing order. Second, in Panel B on the rule of law, the OLS estimate is significantly positive while the estimates from QR are also significant throughout the conditional distribution in an S-shape pattern, with the exception of the 25^{th} quantile. Third, in Panel C on institutional governance, the OLS estimate is not significant while the quantile regression estimates are significant in the $10^{th}$and 50^{th} quantiles. Fourth, the significant control variables display the anticipated signs.

Table 2: Social media and political governance (Hypothesis 1)

	Panel A: Political Stability/No violence					
	OLS	**Q.10**	**Q.25**	**Q.50**	**Q.75**	**Q.90**
Constant	**-4.485*** **	**-5.874*** **	**-6.008*** **	**-5.592*** **	-2.986	**-2.859*** **
	(0.000)	**(0.000)**	**(0.000)**	**(0.001)**	(0.136)	**(0.000)**
Facebook Penetration	-0.010	**-0.049*** **	-0.017	0.013	-0.009	-0.013
	(0.634)	**(0.000)**	(0.200)	(0.676)	(0.711)	(0.176)
Domestic Terrorism	**-0.471*** **	**-0.376*** **	**-0.344*** **	**-0.550*** **	**-0.642*** **	**-0.497*** **
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**
Primary School Enrolment	**0.010** **	**0.012*** **	**0.016*** **	**0.016** **	0.003	**0.010*** **
	(0.047)	**(0.000)**	**(0.000)**	**(0.044)**	(0.668)	**(0.000)**
GDP per capita (log)	**1.016*** **	**1.224*** **	**1.147*** **	**1.119** **	**0.949* **	**0.778*** **
	(0.001)	**(0.000)**	**(0.000)**	**(0.014)**	**(0.056)**	**(0.000)**
Aid to the production sector	**0.005*** **	**0.006*** **	**0.005**** **	**0.007** **	**0.007** **	**0.004*** **
	(0.004)	**(0.000)**	**(0.000)**	**(0.012)**	**(0.016)**	**(0.000)**
Pseudo R^2/Adjusted R^2	0.625	0.596	0.508	0.385	0.323	0.435
Fisher	**15.00*** **					
Observations	36	36	36	36	36	36

	Panel B: Voice & Accountability					
	OLS	**Q.10**	**Q.25**	**Q.50**	**Q.75**	**Q.90**
Constant	-1.944	**-0.687** **	-0.756	-0.593	**-2.028* **	**-2.349*** **
	(0.168)	**(0.022)**	(0.237)	(0.676)	**(0.088)**	**(0.000)**
Facebook Penetration	0.041	**0.038*** **	**0.053*** **	**0.041* **	**0.023* **	0.005
	(0.149)	**(0.000)**	**(0.000)**	**(0.076)**	**(0.094)**	(0.623)
Domestic Terrorism	**-0.158** **	**-0.247*** **	**-0.123*** **	-0.130	**-0.133* **	**-0.140** **
	(0.015)	**(0.000)**	**(0.006)**	(0.236)	**(0.093)**	**(0.012)**
Primary School Enrolment	0.005	0.003	0.004	0.003	0.0007	0.0006
	(0.251)	(0.253)	(0.144)	(0.616)	(0.902)	(0.876)
GDP per capita (log)	0.138	**-0.389*** **	**-0.425*** **	-0.335	**0.575** **	**0.779*** **
	(0.756)	**(0.000)**	**(0.001)**	(0.366)	**(0.034)**	**(0.000)**
Aid to the production sector	**0.005*** **	**0.008*** **	**0.007*** **	**0.006*** **	**0.002** **	**0.002* **
	(0.000)	**(0.000)**	**(0.000)**	**(0.002)**	**(0.024)**	**(0.055)**
Pseudo R^2/Adjusted R^2	0.358	0.430	0.364	0.268	0.298	0.418
Fisher	**9.29*** **					
Observations	36	36	36	36	36	36

	Panel C: Political Governance					
	OLS	**Q.10**	**Q.25**	**Q.50**	**Q.75**	**Q.90**
Constant	**-4.153** **	**-2.805** **	**-3.127*** **	**-3.866** **	**-6.199*** **	**-5.840*** **
	(0.020)	**(0.032)**	**(0.001)**	**(0.047)**	**(0.003)**	**(0.000)**
Facebook Penetration	0.032	0.047	**0.037*** **	-0.004	0.007	-0.009
	(0.445)	(0.200)	**(0.009)**	‘0.882)	(0.847)	(0.577)
Domestic Terrorism	**-0.504*** **	**-0.536*** **	**-0.355*** **	**-0.409*** **	**-0.608*** **	**-0.699*** **
	(0.000)	**(0.001)**	**(0.000)**	**(0.001)**	**(0.000)**	**(0.000)**
Primary School Enrolment	**0.013** **	0.005	**0.012*** **	0.007	0.013	**0.019*** **
	(0.013)	(0.457)	**(0.001)**	(0.398)	(0.131)	**(0.007)**
GDP per capita (log)	0.891	0.377	0.287	**0.985** **	**1.832*** **	**1.670*** **
	(0.129)	(0.112)	(0.166)	**(0.045)**	**(0.000)**	**(0.000)**
Aid to the production sector	**0.009*** **	**0.012*** **	**0.011*** **	**0.009*** **	**0.010*** **	**0.009*** **
	(0.000)	**(0.000)**	**(0.000)**	**(0.003)**	**(0.000)**	**(0.000)**
Pseudo R^2/Adjusted R^2	0.511	0.399	0.363	0.309	0.446	0.516

Fisher	**10.93*** **					
Observations	36	36	36	36	36	36

*, **, ***: significance levels of 10%, 5% and 1% respectively. OLS: Ordinary Least Squares. R² for OLS and Pseudo R² for quantile regression. Lower quantiles (e.g., Q 0.1) signify nations where Political governance is least.

Table 3: Social media and economic governance (Hypothesis 2)

	Panel A: Government Effectiveness					
	OLS	**Q.10**	**Q.25**	**Q.50**	**Q.75**	**Q.90**
Constant	**-2.512****	**-1.248*****	**-2.311****	**-3.418*****	**-2.711****	**-2.192***
	(0.033)	**(0.000)**	**(0.013)**	**(0.008)**	**(0.041)**	**(0.090)**
Facebook Penetration	**0.049***	**0.061*****	**0.042****	0.018	**0.044*****	0.037
	(0.065)	**(0.000)**	**(0.014)**	(0.459)	**(0.003)**	(0.104)
Domestic Terrorism	**-0.107***	**-0.212*****	**-0.110***	-0.076	-0.079	-0.046
	(0.049)	**(0.000)**	**(0.091)**	(0.341)	(0.210)	(0.751)
Primary School Enrolment	0.005	**0.002****	0.004	0.004	0.005	0.002
	(0.175)	**(0.048)**	(0.225)	(0.420)	(0.395)	(0.819)
GDP per capita (log)	0.316	**-0.203*****	0.167	**0.670****	**0.524***	**0.517***
	(0.407)	**(0.001)**	(0.568)	**(0.042)**	**(0.086)**	**(0.055)**
Aid to the production sector	**0.004*****	**0.005*****	**0.005*****	**0.003****	0.524	0.0008
	(0.000)	**(0.000)**	**(0.001)**	**(0.020)**	(0.189)	(0.589)
Pseudo R^2/Adjusted R^2	0.534	0.439	0.390	0.338	0.408	0.495
Fisher	9.44***					
Observations	36	36	36	36	36	36

	Panel B: Regulation Quality					
	OLS	**Q.10**	**Q.25**	**Q.50**	**Q.75**	**Q.90**
Constant	-1.112	0.071	-0.049	-0.678	-1.345	**-2.059***
	(0.277)	(0.932)	(0.939)	(0.431)	(0.332)	**(0.085)**
Facebook Penetration	**0.048***	**0.050****	**0.043*****	**0.031***	**0.052*****	0.020
	(0.083)	**(0.015)**	**(0.000)**	**(0.086)**	**(0.005)**	(0.305)
Domestic Terrorism	**-0.1350****	**-0.277*****	-0.082	-0.103	-0.064	-0.079
	(0.043)	**(0.000)**	(0.142)	(0.133)	(0.504)	(0.543)
Primary School Enrolment	0.0004	-0.003	-0.002	-0.002	0.00008	-0.002
	(0.884)	(0.273)	(0.422)	(0.569)	(0.989)	(0.819)
GDP per capita (log)	0.082	-0.332	**-0.319****	0.062	0.272	**0.728*****
	(0.814)	(0.230)	**(0.045)**	(0.788)	(0.482)	**(0.005)**
Aid to the production sector	**0.004*****	**0.004*****	**0.005*****	**0.003****	0.002	0.001
	(0.000)	**(0.000)**	**(0.000)**	**(0.011)**	(0.222)	(0.381)
Pseudo R^2/Adjusted R^2	0.453	0.420	0.358	0.271	0.343	0.471
Fisher	**9.08*****					
Observations	36	36	36	36	36	36

	Panel C: Economic Governance					
	OLS	**Q.10**	**Q.25**	**Q.50**	**Q.75**	**Q.90**
Constant	-2.460	-0.398	-1.718	**-3.147***	-2.070	-3.142
	(0.293)	(0.295)	(0.340)	**(0.081)**	(0.184)	(0.320)
Facebook Penetration	**0.108***	**0.120*****	**0.094***	0.053	**0.107*****	**0.099***
	(0.071)	**(0.000)**	**(0.077)**	(0.134)	**(0.000)**	**(0.098)**
Domestic Terrorism	**-0.269****	**-0.606*****	-0.152	**-0.297****	**-0.167***	-0.153
	(0.025)	**(0.000)**	(0.172)	**(0.034)**	**(0.068)**	(0.660)
Primary School Enrolment	0.006	**0.006*****	0.008	0.005	-0.001	-0.0004
	(0.342)	**(0.002)**	(0.212)	(0.491)	(0.824)	(0.987)

GDP per capita (log)	0.446	**-0.593*** **	-0.158	0.746	**0.881** **	**1.312** **
	(0.578)	**(0.000)**	(0.801)	(0.123)	**(0.039)**	**(0.054)**
Aid to the production sector	**0.009*** **	**0.011*** **	**0.012*** **	**0.010*** **	**0.004** **	0.002
	(0.000)	**(0.000)**	**(0.000)**	**(0.002)**	**(0.024)**	(0.409)
Pseudo R^2/Adjusted R^2	0.511	0.440	0.384	0.326	0.412	0.503
Fisher	**10.22*** **					
Observations	36	36	36	36	36	36

*, **, ***: significance levels of 10%, 5% and 1% respectively. OLS: Ordinary Least Squares. R^2 for OLS and Pseudo R^2 for quantile regression. Lower quantiles (e.g., Q 0.1) signify nations where Economic governance is least.

Table 4: Social media and institutional governance (Hypothesis 3)

	Panel A: Corruption Control					
	OLS	**Q.10**	**Q.25**	**Q.50**	**Q.75**	**Q.90**
Constant	-1.799	0.584	-0.551	**-1.840*** **	**-3.125** **	-4.014
	(0.114)	(0.310)	(0.660)	**(0.001)**	**(0.024)**	(0.457)
Facebook Penetration	0.035	**0.056*** **	**0.046** **	**0.027*** **	-0.002	-0.035
	(0.140)	**(0.000)**	**(0.054)**	**(0.004)**	(0.870)	(0.501)
Domestic Terrorism	-0.094	-0.091	**-0.188** **	**-0.124*** **	**-0.167** **	-0.170
	(0.118)	(0.109)	**(0.048)**	**(0.002)**	**(0.070)**	(0.618)
Primary School Enrolment	0.003	**-0.007** **	0.0008	**-0.003** **	0.003	0.003
	(0.377)	**(0.010)**	(0.870)	**(0.092)**	(0.625)	(0.887)
GDP per capita (log)	0.213	**-0.393*** **	-0.251	**0.514*** **	**0.826*** **	1.269
	(0.587)	**(0.008)**	(0.565)	**(0.000)**	**(0.007)**	(0.427)
Aid to the production sector	**0.002** **	**0.002** **	**0.003** **	**0.002** **	0.001	0.0002
	(0.037)	**(0.019)**	**(0.089)**	**(0.010)**	(0.228)	(0.948)
Pseudo R^2/Adjusted R^2	0.284	0.330	0.250	0.263	0.298	0.306
Fisher	**4.08*** **					
Observations	36	36	36	36	36	36

	Panel B: Rule of Law					
	OLS	**Q.10**	**Q.25**	**Q.50**	**Q.75**	**Q.90**
Constant	**-2.471** **	**-3.066*** **	**-2.349** **	-2.583	**-2.536** **	**-2.767*** **
	(0.018)	**(0.000)**	**(0.093)**	(0.117)	**(0.079)**	**(0.000)**
Facebook Penetration	**0.042** **	**0.041*** **	0.037	**0.066** **	**0.037** **	**0.022** **
	(0.086)	**(0.000)**	(0.107)	**(0.025)**	**(0.026)**	**(0.058)**
Domestic Terrorism	**-0.146*** **	**-0.210*** **	**-0.163** **	**-0.194** **	**-0.196** **	-0.114
	(0.005)	**(0.000)**	**(0.048)**	**(0.043)**	**(0.044)**	(0.132)
Primary School Enrolment	**0.005** **	**0.011*** **	0.007	0.005	0.003	0.006
	(0.090)	**(0.000)**	(0.141)	(0.526)	(0.645)	(0.254)
GDP per capita (log)	0.331	0.163	0.114	0.351	**0.570** **	**0.647*** **
	(0.300)	(0.123)	(0.782)	(0.404)	**(0.071)**	**(0.000)**
Aid to the production sector	**0.003*** **	**0.005*** **	**0.005*** **	0.004	0.002	0.0002
	(0.000)	**(0.000)**	**(0.002)**	(0.128)	(0.197)	(0.789)
Pseudo R^2/Adjusted R^2	0.535	0.445	0.340	0.287	0.371	0.523
Fisher	**7.54*** **					
Observations	36	36	36	36	36	36

	Panel C: Institutional Governance					
	OLS	**Q.10**	**Q.25**	**Q.50**	**Q.75**	**Q.90**
Constant	-3.300	**-2.412** **	-1.942	-4.186	-4.924	-6.415
	(0.162)	**(0.043)**	(0.422)	(0.111)	(0.166)	(0.153)
Facebook Penetration	0.087	**0.106*** **	0.101	**0.089** **	0.036	-0.022
	(0.104)	**(0.000)**	(0.162)	**(0.063)**	(0.369)	(0.777)

Domestic Terrorism	**-0.268****	**-0.412*****	**-0.418****	**-0.360***	-0.398	-0.366
	(0.024)	**(0.001)**	**(0.015)**	**(0.041)**	(0.101)	(0.472)
Primary School Enrolment	0.010	**0.013****	0.011	0.004	0.004	0.011
	(0.183)	**(0.025)**	(0.200)	(0.692)	(0.798)	(0.766)
GDP per capita (log)	0.606	-0.220	-0.212	**1.148***	**1.684****	**2.263****
	(0.446)	(0.435)	(0.803)	**(0.099)**	**(0.034)**	**(0.022)**
Aid to the production sector	**0.006*****	**0.010*****	**0.010*****	0.006	0.003	0.0004
	(0.001)	**(0.000)**	**(0.009)**	(0.112)	(0.389)	(0.940)
Pseudo R^2/Adjusted R^2	0.419	0.375	0.305	0.283	0.336	0.383
Fisher	**5.96*****					
Observations	36	36	36	36	36	36

*, **, ***: significance levels of 10%, 5% and 1% respectively. OLS: Ordinary Least Squares. R^2 for OLS and Pseudo R^2 for quantile regression. Lower quantiles (e.g., Q 0.1) signify nations where Economic governance is least.

Table 5: Social media and general governance (Robustness check)

	Dependent variable: General governance					
	OLS	**Q.10**	**Q.25**	**Q.50**	**Q.75**	**Q.90**
Constant	-5.671	**-4.780*****	-2.599	-6.200	**-7.489*****	**-8.510****
	(0.123)	**(0.000)**	(0.339)	(0.308)	**(0.006)**	**(0.041)**
Facebook Penetration	0.135	**0.153*****	**0.168****	0.084	**0.095*****	0.035
	(0.131)	**(0.000)**	**(0.042)**	(0.489)	**(0.003)**	(0.617)
Domestic Terrorism	**-0.589*****	**-0.972*****	**-0.530*****	**-0.630***	**-0.564*****	-0.586
	(0.001)	**(0.000)**	**(0.004)**	**(0.090)**	**(0.003)**	(0.202)
Primary School Enrolment	**0.017***	**0.029*****	**0.019***	0.010	0.016	0.013
	(0.099)	**(0.000)**	**(0.060)**	(0.715)	(0.265)	(0.698)
GDP per capita (log)	1.104	-0.209	-0.521	1.587	**2.300*****	**3.026*****
	(0.378)	(0.335)	(0.585)	(0.323)	**(0.000)**	**(0.001)**
Aid to the production sector	**0.014*****	**0.019*****	**0.018*****	0.015	**0.006***	0.004
	(0.000)	**(0.000)**	**(0.000)**	(0.135)	**(0.057)**	(0.478)
Pseudo R^2/Adjusted R^2	0.493	0.421	0.363	0.304	0.395	0.509
Fisher	**9.38*****					
Observations	36	36	36	36	36	36

*, **, ***: significance levels of 10%, 5% and 1% respectively. OLS: Ordinary Least Squares. R^2 for OLS and Pseudo R^2 for quantile regression. Lower quantiles (e.g., Q 0.1) signify nations whereGeneral governance is least.

The following findings can be established in Table 5 on the correlates between general governance and social media. OLS estimates are not significant whereas the corresponding quantile estimates are positively significant in the bottom quantiles and 75^{th} quantile. The significant control variables have the anticipated signs.

It is also apparent from the findings that the intercept is significantly negative for the most part. This implies that irrespective of determinants of governance, autonomous governance is negative. It follows that if there are no determinants of governance, governance is negative. This negativity may be traceable to the fact that the governance variables in African countries are overwhelmingly negatively skewed.

In the light of the above, all the investigated hypotheses are confirmed, with a slight exception, notably the negative relationship between Facebook penetration and political stability in the 10^{th} quantile of Table 2. The counter-intuitive findings can be explained from the perspective that social media has also been documented to grease violent collective action (Breuer *et al*., 2012; Pierskalla & Hollenbach, 2013; Weidmann & Shapiro, 2015; Manacorda & Tesei, 2016). Hence, social media can also reduce government quality, especially in the light of Morozov (2011) who has noted that information technology can be captured and used as an instrument of propaganda by incumbent governments.

It is also relevant to articulate that the 49 observations decrease to 36 due to data availability constraints in Facebook penetration and governance variables. The retained 36 countries include: Algeria, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Democratic Republic of the Congo, Djibouti, Egypt, Equatorial Guinea, Ghana, Guinea, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Republic of the Congo, Rwanda, Senegal, Sierra Leone, South Africa, Swaziland, Tanzania, The Gambia, Togo, Tunisia and Zambia.

The quantile regressions are presented such that the findings vary from countries with low governance quality to countries with high governance quality. Hence, in order to facilitate the understanding of corresponding implications, it is worthwhile to complement results with a presentation of the country-specific institutional indicators in increasing order of importance. In other words, for the engaged governance dynamics, the upper parts of Tables 6-7 reflect countries with low levels of governance while the lower parts reflect countries with higher levels of governance. Table 6 presents country-specific political and economic governance levels while Table 7 shows country-specific institutional and general governance levels. From a quick comparative perspective, it is apparent that established findings in bottom quantiles are driven by countries with French civil law transition while results in the top quantiles are driven by countries with English common law transition. The competitive edge of countries with British common law heritage (compared to their counterparts with French civil law heritage) can be explained by political and adaptability perspectives documented by Beck *et al*. (2003) on why legal origins are relevant in comparative development.

First, according to the political channel, English common law countries place more priority in private property rights while French civil law countries are more concerned with the power of the State. Hence, the relevance of social media as a right, may be more consistent with the existing laws in countries with English common law heritage. Second, from the adaptability channel, because of more emphasis on jurisprudence, English common law is designed to quickly adapt to changes in society and the evolution of technology (e.g. the advent of social media) compared to French civil law which is dominated by the strict interpretation of laws by judges. Moreover, the dominance of English common law countries has been confirmed in various areas of governance, notably: accounting standards (La Porta *et al*., 1998); less corruption and better institutions (La Porta *et al*., 1999); courts with enhanced efficiency (Djankov *et al*., 2003) and development outcomes in Africa (Asongu, 2014; Agbor, 2015; Asongu & Nwachukwu, 2018).

However, note should also be taken of the fact that Tables 6-7 are meant to inform policy makers on the associations between sampled countries, governance levels and established results. Causality cannot be drawn from such associations as they remain exploratory and informative.

Table 6: Country-specific governance levels (political and economic governances)

	Voice & Accountability		Political stability/No violence		Political Governance		Regulation Quality		Government Effectiveness		Economic Governance	
	Countries	Value	Countries	Value	Countries	Value	Countries	Value	Countries	Value	Countries	Value
1	Equatorial Guinea	-1.883	Democratic Republic of the Congo	-2.137	Democratic Republic of the Congo	-1.982	Democratic Republic of the Congo	-1.510	Democratic Republic of the Congo	-1.659	Democratic Republic of the Congo	-1.938
2	Democratic Republic of the Congo	-1.509	Mali	-2.021	Central African Republic	-1.548	Equatorial Guinea	-1.423	Equatorial Guinea	-1.650	Equatorial Guinea	-1.831
3	Republic of the Congo	-1.509	Central African Republic	-1.872	Burundi	-1.049	Republic of the Congo	-1.378	Chad	-1.493	Republic of the Congo	-1.279
4	Djibouti	-1.417	Burundi	-1.685	Chad	-1.019	Algeria	-1.293	Central African Republic	-1.462	Chad	-1.278
5	Chad	-1.346	Egypt	-1.465	Mali	-0.955	Central African Republic	-1.089	Togo	-1.326	Central African Republic	-1.253
6	The Gambia	-1.278	Algeria	-1.319	Guinea	-0.909	Chad	-1.080	Burundi	-1.312	Guinea	-0.971
7	Central African Republic	-1.264	Kenya	-1.316	Algeria	-0.782	Guinea	-1.020	Guinea	-1.278	Burundi	-0.940
8	Rwanda	-1.257	Guinea	-1.281	Egypt	-0.763	Burundi	-0.958	Sierra Leone	-1.204	Togo	-0.844
9	Swaziland	-1.196	Niger	-1.160	Republic of the Congo	-0.756	Cameroon	-0.933	Republic of the Congo	-1.202	Sierra Leone	-0.543
10	Guinea	-1.059	Mauritania	-1.130	Mauritania	-0.698	Togo	-0.856	Djibouti	-1.096	Cameroon	-0.455
11	Togo	-1.042	Chad	-1.057	Equatorial Guinea	-0.610	Malawi	-0.715	Madagascar	-1.089	Algeria	-0.448
12	Cameroon	-1.031	Tunisia	-0.742	Swaziland	-0.401	Sierra Leone	-0.707	Mali	-0.986	Madagascar	-0.271
13	Mauritania	-0.957	Burkina Faso	-0.587	Cameroon	-0.357	Mauritania	-0.645	Mauritania	-0.922	Mauritania	-0.158
14	Algeria	-0.898	Madagascar	-0.582	Rwanda	-0.296	Niger	-0.608	Cameroon	-0.904	Djibouti	-0.134
15	Burundi	-0.891	Cameroon	-0.577	Togo	-0.242	Madagascar	-0.577	Egypt	-0.800	Mali	0.014
16	Madagascar	-0.872	Republic of the Congo	-0.492	Kenya	-0.208	Swaziland	-0.562	Niger	-0.707	Niger	0.125
17	Egypt	-0.765	Morocco	-0.462	Madagascar	-0.207	Lesotho	-0.537	Tanzania	-0.693	Egypt	0.150
18	Morocco	-0.634	Swaziland	-0.421	Djibouti	-0.177	Egypt	-0.490	Mozambique	-0.634	Malawi	0.250
19	Mali	-0.535	Togo	-0.407	The Gambia	-0.164	Mozambique	-0.459	Burkina Faso	-0.630	Swaziland	0.353
20	Sierra Leone	-0.351	Sierra Leone	-0.280	Niger	-0.120	Djibouti	-0.445	Swaziland	-0.549	Mozambique	0.371
21	Burkina Faso	-0.335	Rwanda	-0.202	Morocco	0.112	Zambia	-0.429	Algeria	-0.547	Tanzania	0.371
22	Niger	-0.335	Senegal	-0.116	Tunisia	0.305	Mali	-0.423	Kenya	-0.539	Zambia	0.555

23	Kenya	-0.305	South Africa	-0.021	Burkina Faso	0.307	Tanzania	-0.399	Benin	-0.526	Lesotho	0.561
24	Malawi	-0.223	The Gambia	0.001	Sierra Leone	0.521	Benin	-0.394	The Gambia	-0.513	Benin	0.563
25	Tunisia	-0.218	Malawi	0.003	Malawi	0.856	Kenya	-0.310	Zambia	-0.500	Kenya	0.641
26	Mozambique	-0.198	Tanzania	0.023	Tanzania	0.908	The Gambia	-0.230	Malawi	-0.491	Burkina Faso	0.748
27	Tanzania	-0.184	Ghana	0.107	Senegal	0.947	Tunisia	-0.208	Senegal	-0.471	The Gambia	0.759
28	Zambia	-0.143	Djibouti	0.165	Mozambique	1.130	Burkina Faso	-0.119	Lesotho	-0.388	Senegal	0.954
29	Senegal	-0.036	Equatorial Guinea	0.187	Lesotho	1.300	Rwanda	-0.101	Ghana	-0.072	Tunisia	1.305
30	Lesotho	0.045	Lesotho	0.253	Zambia	1.382	Senegal	-0.095	Morocco	-0.069	Morocco	1.410
31	Benin	0.094	Benin	0.319	Benin	1.397	Morocco	-0.092	Rwanda	-0.060	Rwanda	1.410
32	Namibia	0.370	Mozambique	0.339	Ghana	1.536	Namibia	0.065	Tunisia	-0.049	Ghana	1.635
33	Ghana	0.401	Zambia	0.606	South Africa	1.589	Ghana	0.117	Namibia	0.131	Namibia	1.807
34	Botswana	0.503	Namibia	0.939	Namibia	2.125	South Africa	0.374	South Africa	0.325	South Africa	2.365
35	South Africa	0.556	Mauritius	0.962	Botswana	2.359	Botswana	0.694	Botswana	0.447	Botswana	2.854
36	Mauritius	0.864	Botswana	1.080	Mauritius	2.619	Mauritius	0.984	Mauritius	0.951	Mauritius	3.740

Table 7: Country-specific governance levels (institutional and general governances)

	Corruption-Control		The Rule of Law		Institutional Governance		General Governance	
	Countries	Value	Countries	Value	Countries	Value	Countries	Value
1	Equatorial Guinea	-1.561	Democratic Republic of the Congo	-1.653	Democratic Republic of the Congo	-1.840	Democratic Republic of the Congo	-3.316
2	Burundi	-1.439	Chad	-1.454	Equatorial Guinea	-1.734	Equatorial Guinea	-2.465
3	Democratic Republic of the Congo	-1.304	Central African Republic	-1.446	Chad	-1.565	Central African Republic	-2.258
4	Cameroon	-1.267	Guinea	-1.433	Burundi	-1.392	Chad	-2.252
5	Chad	-1.251	Equatorial Guinea	-1.263	Guinea	-1.330	Burundi	-1.941
6	Republic of the Congo	-1.192	Republic of the Congo	-1.117	Cameroon	-1.145	Guinea	-1.867
7	Kenya	-1.094	Burundi	-1.079	Republic of the Congo	-1.137	Republic of the Congo	-1.848
8	Guinea	-1.073	Cameroon	-1.039	Central African Republic	-1.129	Cameroon	-1.144
9	Togo	-1.020	Togo	-0.940	Kenya	-0.753	Togo	-1.082
10	Sierra Leone	-0.952	Mauritania	-0.904	Togo	-0.744	Mauritania	-0.681
11	Benin	-0.932	Madagascar	-0.901	Sierra Leone	-0.591	Algeria	-0.611
12	Central African Republic	-0.894	Sierra Leone	-0.873	Mauritania	-0.354	Mali	-0.611
13	Tanzania	-0.802	Kenya	-0.866	Mali	-0.200	Sierra Leone	-0.399
14	Mali	-0.785	Djibouti	-0.777	Madagascar	-0.160	Madagascar	-0.380
15	Mauritania	-0.726	Algeria	-0.754	Benin	-0.111	Kenya	-0.169
16	The Gambia	-0.643	Niger	-0.694	Tanzania	-0.079	Egypt	-0.139
17	Niger	-0.633	Mali	-0.693	Niger	-0.020	Djibouti	-0.081
18	Egypt	-0.586	Mozambique	-0.598	Algeria	0.105	Niger	0.006
19	Mozambique	-0.577	Tanzania	-0.559	The Gambia	0.128	Swaziland	0.323

20	Madagascar	-0.566	The Gambia	-0.544	Mozambique	0.149	The Gambia	0.430
21	Burkina Faso	-0.520	Swaziland	-0.460	Djibouti	0.199	Tanzania	0.663
22	Algeria	-0.476	Egypt	-0.460	Egypt	0.284	Burkina Faso	0.847
23	Malawi	-0.442	Benin	-0.443	Burkina Faso	0.394	Mozambique	0.911
24	Morocco	-0.440	Burkina Faso	-0.431	Swaziland	0.554	Benin	1.026
25	Djibouti	-0.376	Zambia	-0.403	Zambia	0.618	Malawi	1.029
26	Swaziland	-0.360	Senegal	-0.320	Malawi	0.688	Morocco	1.336
27	Zambia	-0.358	Lesotho	-0.287	Morocco	0.720	Zambia	1.436
28	Senegal	-0.292	Rwanda	-0.263	Senegal	0.784	Senegal	1.544
29	South Africa	-0.165	Malawi	-0.242	Tunisia	1.134	Tunisia	1.629
30	Tunisia	-0.145	Morocco	-0.214	Lesotho	1.295	Lesotho	1.803
31	Ghana	-0.103	Tunisia	-0.155	Ghana	1.312	Rwanda	1.835
32	Lesotho	0.106	Ghana	-0.036	South Africa	1.355	Ghana	2.586
33	Namibia	0.292	South Africa	0.075	Rwanda	1.968	South Africa	3.082
34	Mauritius	0.391	Namibia	0.238	Namibia	2.075	Namibia	3.455
35	Rwanda	0.648	Botswana	0.654	Mauritius	2.948	Botswana	4.908
36	Botswana	0.919	Mauritius	0.950	Botswana	3.265	Mauritius	5.407

5. Concluding implications, caveats and future research directions

This study has assessed linkages between social media and governance dynamics in 49 African countries for the year 2012. The empirical evidence is based on ordinary least squares and quantile regressions. Ten bundled and unbundled governance dynamics are used, notably: (i) political governance (entailing “voice & accountability” and political stability/no violence); (ii) economic governance (involving regulation quality and government effectiveness); (iii) institutional governance (comprising the rule of law and corruption-control) and (iv) general governance (entailing political, economic and institutional governance). Social media is measured with Facebook penetration. The findings show that Facebook penetration is positively associated with governance dynamics and these positive nexuses differ in terms of significance and magnitude of significance throughout the conditional distribution of governance dynamics. In what follows, we justify why the findings and corresponding implications can be extended to other regions of the world, especially those that are equally characterized by poor governance and low penetration levels in social media.

It is important to note that extending the implications of the findings to other regions with similar characteristics as Africa does not necessarily imply that social media will enhance all dimensions of governance being considered. For example, contingent on the development paradigm being adopted by a country, political governance may be emphasized in place of economic governance, as a strategy for economic prosperity and human development. Therefore, policy makers need to consider how “social media”-driven governance can influence their development outcomes, with the development paradigm of the country in mind. To put this caution into perspective, there are currently two dominant development models that have different governance priorities, namely: the Beijing Model and the Washington Consensus.

Consistent with Asongu and Ssozi (2016), the Washington Consensus can be defined as "*liberal democracy, private capitalism and priority in political rights*" while the Beijing Model can be defined as "*de-emphasised democracy, state capitalism and priority in economic rights*". In the light of the framework of this study, political (economic) rights are consistent with political (economic) governance.

The coupling and decoupling of governance dynamics also offers more avenues for policy options. This is essentially because even within a specific dimension of governance, priorities from the two dominant models could still be quite distinct. For instance, from the perspective of political governance (i.e. consisting of "voice and accountability" and political stability), China, which advocates for the BeijingModel, enjoys relatively greater political stability compared to African countries which have largely embraced prescriptions of the Washington Consensus and, hence, are more in tune with the "voice and accountability" aspect of political governance. In a nutshell, the conclusions of this study are relevant to other developing countries, contingent on adopted development paradigms on the one hand and priorities in governance dynamics for economic development, on the other hand[7].

The findings established in the study are interpreted as relationships owing to data availability constraints at the time of the study. Hence, as more data become available, it will be worthwhile to explore whether and how the established findings withstand empirical scrutiny within a causality empirical framework. Moreover, country-specific analyses will also be worthwhile for more idiosyncratic policy implications. It is also unfortunate that we cannot increase the number of observations because we are focusing on a specific region andwe are constrained by data availability. Given that the exploratory findings can be informative for other regions of the world that are experiencing similar tendencies in poor governance and low information technology penetration, it would be worthwhile to also assess if the established findings withstand empirical scrutiny in different regions. The recommendation is motivated by the fact that different regions are driven by countries that have adopted different paradigms of economic development. Hence, social media may not be positively related with all governance dynamics. Furthermore, as more data become available it will be worthwhile to confirm the dominance of English common law countries over their French civil law counterparts, within a panel empirical framework.

[7]More insights can be found in Asongu and le Roux (2018). In the light of blur prospects for Africa in the MDGs and SDGs (Bicaba et al., 2017; Asongu et al., 2017), the authors have recently built on these two dominant models and corresponding governance dynamics to elicit the extreme poverty tragedy of Africa.

Appendices

Appendix 1: Definitions of variables

Variables	Definitions of variables (Measurements)	Sources
Political Stability	“Political stability/no violence (estimate): measured as the perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional and violent means, including domestic violence and terrorism”	World Bank (WGI)

Voice & Accountability	"Voice and accountability (estimate): measures the extent to which a country's citizens are able to participate in selecting their government and to enjoy freedom of expression, freedom of association and a free media".	World Bank (WGI)
Political Governance	First Principal Component of Political Stability and Voice & Accountability. The process by which those in authority are selected and replaced.	PCA
Government Effectiveness	"Government effectiveness (estimate): measures the quality of public services, the quality and degree of independence from political pressures of the civil service, the quality of policy formulation and implementation, and the credibility of governments' commitments to such policies".	World Bank (WGI)
Regulation Quality	"Regulation quality (estimate): measured as the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development".	World Bank (WGI)
Economic Governance	"First Principal Component of Government Effectiveness and Regulation Quality. The capacity of government to formulate & implement policies, and to deliver services".	PCA
Rule of Law	"Rule of law (estimate): captures perceptions of 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, the courts, as well as the likelihood of crime and violence".	World Bank (WGI)
Corruption-Control	"Control of corruption (estimate): captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as 'capture' of the state by elites and private interests".	World Bank (WGI)
Institutional Governance	First Principal Component of Rule of Law and Corruption-Control. The respect for citizens and the state of institutions that govern the interactions among them	PCA
General Governance	First Principal Component of Political, Economic and Institutional Governances	PCA
Facebook Penetration	Facebook penetration (2012), defined as the percentage of total population that uses Facebook.	Quintly.
Domestic Terrorism	Number of Domestic terrorism incidents (log)	Ender et al. (2011) and Gailbulloev et al. (2012)
Primary School Enrolment	School enrollment, primary (% gross), WDI	World Bank (WDI)
GDP per capita	Gross Domestic Product per capita (log), WDI	World Bank (WDI)
Aid to the Productive sector	Foreign aid directed at the productive sector like agriculture, industry, mining, construction, trade and tourism(log)/OECD.	World Bank (WDI)

WGI: World Governance Indicators of the World Bank. WDI: World Development Indicators of the World Bank. GDP: Gross Domestic Product. OECD: Organisation for Economic Co-operation and Development. PCA: Principal Component Analysis.

Appendix 2: Summary Statistics and presentation of countries

Panel A: Summary Statistics

Variables	Mean	Standard dev.	Minimum	Maximum	Obsers
Political Stability	-0.648	0.898	-2.846	1.080	49
Voice & Accountability	-0.742	0.707	-2.233	0.863	49
Political Governance	-0.131	1.199	-3.210	2.619	49
Government Effectiveness	-0.794	0.615	-2.225	0.951	48

Regulation Quality	-0.692	0.659	-2.256	0.983	49
Economic Governance	-0.603	1.378	-3.395	3.739	48
Rule of Law	-0.747	0.611	-2.450	0.949	49
Corruption Control	-0.699	0.565	-1.590	0.918	49
Institutional Governance	-0.157	1.272	-3.028	3.264	49
General Governance	-0.182	2.130	-5.562	5.406	48
Facebook Penetration	4.345	5.828	0.286	27.693	44
Domestic terrorism	0.928	1.525	0.000	6.234	49
Primary School Enrolment	106.315	18.799	69.538	145.186	39
GDP per capita (log)	2.953	0.485	2.185	4.074	48
Aid to the Public sector	43.444	61.624	0.04	281.21	49

Panel B: Sampled countries (49)

Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Cote d' Ivoire, Democratic Republic of the Congo, Djibouti, Egypt, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Republic of the Congo, Rwanda, Senegal, Sierra Leone, Somalia, South Africa, Sudan, Swaziland, Tanzania, The Gambia, Togo, Tunisia, Uganda, Zambia and Zimbabwe

Standard dev: standard deviation. Obsers: Observations.

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