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Adegboye, Alex; Asongu, Simplice; Tchamyou, Vanessa; Osinubi, Tolulope Temilola; Adeyanju, Ibukunoluwa

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Educational quality, social media and public accountability: A global perspective

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WP/21/086

Educational quality, social media and public accountability: a global perspective

Alex Adegboye
(Corresponding Author)
Covenant University, Ogun State, Ota, Nigeria
E-mail: adegboyea1@gmail.com

Simplice A. Asongu
African Governance and Development Institute,
P. O. Box 8413, Yaoundé, Cameroon
E-mail: asongusimplice@yahoo.com

Vanessa S. Tchamyou
African Governance and Development Institute,
P. O. Box, 8413, Yaoundé, Cameroon
E-mails: simenvanessa@yahoo.com

Tolulope T. Osinubi
Department of Economics,
Obafemi Awolowo University, Ile-Ife, Nigeria,
E-mail :tosinubi@oauife.edu.ng

Ibukunoluwa Adeyanju
Covenant University, Ogun State, Ota, Nigeria
E-mail: temiloluwadeyanju@gmail.com

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Research Department

Educational quality, social media and public accountability: a global perspective

Alex Adegboye, Simplice A. Asongu, Vanessa S. Tchamyou, Tolulope T. Osinubi & Ibukunoluwa Adeyanju

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Abstract

This inquiry relates to the empirical linkages between educational quality, Facebook penetration and accountability dynamics. The empirical investigation is based on the Ordinary Least Squares (OLS) technique and Quantile regression for the conditional linkages which articulate low, middle, and high initial levels of public accountability. It explores a cross-section of 168 countries. The main finding is that there is an overwhelming positive connection between Facebook penetration and accountability dynamics. The established positive nexus is apparent in all quantiles of public accountability. In addition, tertiary and secondary school enrollment positively influence public accountability. By utilizing a novel dataset in analyzing the established nexuses, this study adds to the existing literature on social media and governance (i.e., educational quality, Facebook penetration and accountability dynamics). Similarly, the posture addresses contemporary policy concerns regarding a lack of documentation on the impacts of social media.

Keywords: education, school enrollment, social media, accountability.

1. Introduction

The relevance of information and communication technology (ICT) in development outcomes is becoming increasingly discussed in the literature (Ali et al., 2020; Asongu et al., 2019; Chatterjee, 2020; Tchamyou, 2017). One consequence is that the potential penetration might be utilized to deal with conspicuous policy pathologies (Asongu & Odhiambo, 2019a). However, in spite of the literature threads on the relevance of ICT in state-building, the facet of social media has been largely neglected (Asongu & Odhiambo, 2019a; Jha & Kodila-Tedika, 2020; Neu et al., 2019).

Social media enhances individuals' exposure to various trending facts and opinions (Castronova et al., 2015). In other words, social media allows individuals of various ideological opinions to interact and share knowledge. Nevertheless, public information consumption via social media is not confined solely to conversations between relatives, acquaintances and colleagues (Kaplan & Haenlein, 2010). Consequently, it is highly unlikely that when individuals utilize social media, they would sect the information they are exposed to, bypass information, whereas users are vulnerable to most of the information shared by innumerable sources (Brundidge, 2010).

The rise of social media has caused publishing and audience dispersion to be popular. The audiences are structured as active recipients, and being an audience is not much more active and participatory(Wu, 2018). Social media may be utilized to search for new audiences, sources, verification of content, and demanding accountability (Neu et al., 2019). Tufekci (2017) attests that social media have developed a new public space to converge, communicate and vigorously call for accountability to bring about constructive change in society. Interestingly, the capability of social media to channel for social accountability encourages international organizations to actively promote social accountability initiatives. These initiatives include (i) global partnership for social accountability of the World Bank; (ii) fostering social accountability of the United Nations Development Program (UNDP) and (iii) strengthening the Paris Agreement Transparency Framework through social accountability tools of Transparency International. Even though the initiatives vary widely, they are always supposed that demanding accountability via social media could lead to beneficial societal change generally.

Furthermore, social media makes it possible for each participant to respond to "public" events and offers the opportunity for individualized replies to become collective (Kavada, 2015). Social media can affect the way public accountability is exercised(Munro & Thanem, 2018). Twitter and Facebook have been made essential platforms to disseminate public interest information and assemble social movements, as renowned academics in social media observe (Neu et al., 2019; Wu, 2018). For instance, social media from the Arab Spring through the demonstrations of the indignados in Spain and the Occupy movement have been utilized as a part of a public-space restructuring project, including the gathering of various groups in 'occupied' venues, such as Cairo Tahrir Square and the New York Zuccotti Park (Gerbaudo, 2012). Because of the essential role of social media in recent municipal movements, increased interest has occurred in governance. Therefore, much recent research has postulated and explored the linkages between internet-oriented platforms, such as social media and political development. Most of these studies are based on the fact that social media have been important in the struggle to achieve democracy during the "Arab Spring" in several North African and Middle East nations(Wu, 2018).

Hitherto, the possible function of the web and social media has been classified into two categories in extant literature (Ceron, 2017). Some studies identify social media as a coercive public realm that allows for a dialogue based on objective interactions between citizens and politicians (Bates, 2007; Coleman & Blumler, 2009). This enables more openness, accountability and the strengthening of the democratic system (Khazaeli & Stockemer, 2013). In addition, the new technology might overcome hurdles to "idealized" direct or deliberative democracy and could open possibilities for minor and incoming political players with fewer resources, therefore minimizing political competitiveness disparities (Ceron, 2017; Ceron et al., 2015).

Other academics have a more skeptical perspective (Hilbert, 2009). First, they argue that online communities might have undesirable repercussions for democracy since they are radicalizing rather than moderating their users' viewpoints, an ideological source of interference (Stewart, 2011; Sunstein, 2001). But from the other hand, some scholars posit that new technology is only a tool, and political players would merely reproduce the same paradigm in the new technological era after adaptation, thereby strengthening political disparities (Schlozman et al., 2010). The established political parties may be the biggest supporters and ardent users of technology

developments to promote the notion of strengthening the online relations of political power that they are still dominant (Ceron et al., 2015; Gibson, 2015).

However, not much has been explored in the empirical literature on the linkages between social media and political development. More so, data availability limits contribute to the paucity of empirical research (Asongu et al., 2019). This is because only a few macroeconomic empirical studies have proxied social media with Facebook penetration. Jha & Sarangi (2017) look into how Facebook usage affects corruption. Kodila-Tedika (2021) investigates the impact of Facebook penetration on natural resource management; meanwhile, Jha & Kodila-Tedika (2018)assess whether Facebook penetration drives democracy. Asongu & Odhiambo (2019a) provide the empirical linkages between Facebook usage and the governance dynamics in Africa. Whilst Asongu et al. (2019) assess how social media, precisely Facebook penetration, influence terrorism, Asongu & Odhiambo (2020) examine the role of Facebook penetration on inclusive human development in African countries.

With a bunch of aforementioned literature, the empirical insights into social media, specifically Facebook penetration, and accountability remain scant. Thus, this study seeks to answer the research question relating to what extent could educational quality and social media influence accountability. This study presumes that the educational well-being of the citizens and the usage of social media could influence the demand for accountability from the public holders. This implies that the level of education may encourage reasoned conversations on social platforms, ensuring that political sects are obliged to answer for their activities and decisions.[1]

In order to answer the underpinning research question, this study explores the cross-section of 168 countries for the year 2012. This study uses an Ordinary Least Square (OLS) empirical technique due to the cross-sectional nature of the data structure. The OLS technique, on the other hand, estimates parameters in their mean form. Due to the limitations of this technique, it is necessary to estimate the conditional nexuses further to make a more accurate comparison. Using Quantile regression, the conditional connection will estimate the low, middle, and high initial levels of public accountability. The main finding is that there is an overwhelming positive

[1]Political accountability checkmates the actions of opportunistic leaders and this allows the government to function efficiently and effectively. Accountability is strongly associated with citizen participation, governance responsiveness and strong rule of law, which constitute democratic practices.

connection between Facebook penetration and accountability dynamics, while tertiary and secondary school enrollment is likely to influence public accountability positively. In addition, this study contributes to the extant literature on social media and governance by exploiting a new dataset in assessing the established nexuses (i.e., educational quality, Facebook penetration and accountability dynamics). Likewise, the stance addresses recent policy concerns about the paucity of documentation on social media's consequences(World Bank, 2016).

It is essential to note that even though social media's primary purpose is not to facilitate policy discussions; it can impact policy formation, particularly in the field of governance. Beyond the purview of theoretical foundations, it is relevant to highlight that theory-building can be advanced by applied econometrics motivated by sound intuition in light of reasoning taken from current theoretical underpinnings (Asongu & Odhiambo, 2019a).This stance is consistent with extant literature that the scope of applied econometrics should not be restricted to investigations that reject or accept hypotheses based on current theoretical frameworks (Asongu et al., 2021; Costantini & Lupi, 2005).

The remainder of the research is organized in the following manner. Section 2 discloses the data and methods. The empirical findings are presented in Section 3, and the concluding consequences and future research prospects are discussed in Section 4.

2 Data and Methodology

2.1 Data

With data for the year 2012, this study assesses a cross-sectional sample of one hundred and sixty-eight (168) countries. Likelihoods in data constraints dictate the sample of the research and periodicity (especially for social media data being accessible for 2012). The data used in this study is sourced from Varieties of Democracy database (V-Dem), World Development Indicator (WDI), World Governance Indicator (WGI) of World Bank database and Quintly database.

Data for accountability indicator is extracted from Varieties of Democracy (V-Dem) and World Governance Indicator database. In comparison with Polity2 and Freedom House data, the V-Dem database creates innovative initiative to estimate better democracy indicators (Asongu et al.,

2021). To capture the multidimension of accountability dynamics, this study employs six (6) indicators, namely, (i) the vertical accountability that identifies the power of the citizens in holding the government accountable through formal political participation of the citizens and free election; (ii) diagonal accountability that captures the mechanisms engaged by the citizens, civil society and media to ensure accountability of the government; (iii) horizontal accountability that covers the capacity of the state institutions to demand for information, querying and punishing officials for improper behaviour; (iv) judicial accountability that operationalizes the frequency of judges being dismissed or punished for serious misconduct; (v) accountability index that measures the constraint on political power of the government; (vi) voice and accountability that measures the extent of citizens' participations in the government selection. Notably, the first five indicators are extracted from the V-Dem database whereas the last measure is derived from World Governance Indicator for robustness check.

Accordingly, this study borrows the Facebook penetration data for the year 2012 from contemporary literature (Asongu et al., 2019; Asongu & Odhiambo, 2019b, 2020; Jha & Kodila-Tedika, 2020), who extract such data from "Quintly – a social media benchmarking and analytic solution company". Given that the underlying published papers that have engaged Facebook penetration as a proxy for social media indicate the quality and relevancy of such data.

This study engages three indicators for education quality for influencing public accountability, namely, (i) primary school enrollment (in gender parity index); (ii) secondary school enrollment (in gender parity index) and; (iii)tertiary school enrollment (in gender index). Although prior studies have identified the relative position of primary school in socioeconomic development of a nation especially during her early stage of industrialization (Asongu et al., 2019; Asongu & Odhiambo, 2019a), this present study further examines other levels of education (i.e. secondary and tertiary). This action is intended to confirm the necessity of lifelong learning among the citizens for holding the government accountable for any deeds.

To eliminate any omitted variable bias, three sets of conditioning information are explored in this study. The control variables include; urbanization, GDP per capita and trade openness. The nexuses of the control variables remain debatable in extant literature on governance (Asongu & Asongu, 2019; Asongu & Odhiambo, 2019b; Barnett, 2016; Lyon & Humbert, 2012). Furthermore, Appendix 1 discloses the variables' definitions and their sources. Whereas

Appendix 2 provides the summary statistics that inform the comparability of variables from the mean value perception, Appendix 3 shows the correlation matrix, which is used to control for any multicollinearity concern that might bias the estimated models.

2.2 Methodology

Due to cross sectional nature of the data structure, this study adopts an Ordinary Least Square (OLS) empirical strategy. Prior studies have engaged such estimation strategy following the pattern of the dataset (Asongu et al., 2019; Asongu & Odhiambo, 2019b, 2020; Jha & Kodila-Tedika, 2020). The following equation (i) narrates the relationship between education quality, social media and public accountability:

$$PA_i = \beta_1 + \beta_2 Media_i + \beta_3 Edu_i + \beta_4 X_i + \varepsilon_i \qquad \text{(i)}$$

where PA_i represents the public accountability dynamics (i.e., general accountability; vertical accountability; horizontal accountability; diagonal accountability; judicial accountability; and voice & accountability) for country *i*. $Media_i$ is the social media proxied by Facebook penetration. Edu_i represents educational quality (primary, secondary & tertiary school enrollment (in gender index)) while X_i is the vector of conditioning information including urbanization, GDP per capita growth and trade openness. B_i is the constant and ε_i stands for the error term.

Accordingly, parameters are estimated in their mean form under OLS approach. In other words, an average value of public accountability is established for estimation via OLS. In addition, OLS technique is limited as the relationship between the variables of interest (i.e., education quality, social media and accountability) is likely considered based on the existing levels of the dependent variables (i.e., the accountability dynamics). With the shortcoming of such technique, it is appropriate to further estimate the conditional nexuses for better comparison. The conditional relationship will estimate the low, intermediate and high initial levels of public accountability.

Following prior studies (Asongu et al., 2019; Klomp & Haan, 2012; Paunov & Rollo, 2016), this study estimates the initial levels of public accountability using Quantile regression approach.

Most importantly, the quantile regression technique intends to create more room for policy consequences. Therefore, the *θth* quantile estimator of public accountability is estimated as the optimization problem is solved, which is shown in equation (ii) below without subscript for simplicity and readability purpose.

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

where $\theta \in (0,1)$. and the residual of ε_i is derived from $y_i - x_i \beta$. Whereas the absolute parameters of positive residual are estimated via θ, the negative residuals are estimated by *1- θ*. The weighted sum of absolute deviations is minimized via the quantile regression technique, which is contrary to the ordinary least squares that minimizes the sum of absolute deviations. For instance, the 10th or 25th or 30th quantile (with θ = 0.10 or 0.25 or 0.30 respectively) are weighted using absolute residuals. Thus, conditional quantile of public accountability or y_i given x_i is:

$$Q_y(\theta / x_i) = x_{i'} \beta_{\theta'} \qquad \text{(iii)}$$

where each θth specific quantile is modelled via unique slope parameters. This pattern is equivalent to $E(y/x) = x_i \beta$ under OLS slope where the mean of public accountability is accessed. As for equation (iii), y_i is the dependent variable (i.e., public accountability dynamics) whereas x_i represents the variables of interest and the control variables (social media, education quality, urbanization, GDP per capita and trade openness). This pattern of estimation is consistent with extant literature on social media (Asongu et al., 2019; Jha & Kodila-Tedika, 2020; Wu, 2018). In essence, it is imperative to note the shortcomings of the adopted techniques. The techniques fail to consider the possibility of causality. First, this is due to the cross-sectional nature of the dataset. Second, it is unlikely to establish any causality bearing in mind the nature of the dataset (Asongu & Odhiambo, 2020).

3. Empirical Results

3.1 Baseline findings

This section unveils the empirical findings from Tables 1-6 and the Tables account for the findings both in OLS and Quantile regressions. Notably, Table 1 reports the linkages between education quality, social media and accountability index whereas Table 2 represents the nexuses between education quality, social media and vertical accountability. The focus of Table 3 is the connection between education quality, social media and horizontal accountability. While Table 4 focuses on the relationship between education quality, social media and diagonal accountability, Table 5 is concerned with the links between education quality, social media and judicial accountability. Table 6 shows findings on the influence of education quality and social media on voice & accountability. In addition, each table contains three divisions (Panel A, Panel B & Panel C), which show the results of tertiary, secondary and primary school enrolments, respectively.

The study documents the following findings from Table 1 on linkages between education quality, social media and accountability index. Overall, the nexus between social media on accountability index is overwhelmingly significant and remains positive for all specifications. As regards the relationship with education quality, the following findings are documented. First, in Panel A relating to tertiary school enrolment, the results from OLS, 10th, 30th, 40th & 60th quantile respectively are positively significant. Second, in Panel B on secondary school enrolment, the outcomes from both techniques are positively significant except for 10th, 20th, 30th & 50th quantiles. Third, in Panel C relating to primary school enrolment, both techniques remain insignificant all through.

From Table 2 on nexuses between education quality, social media and vertical accountability, the following findings are unfolded. It is apparent for both techniques that the effect of social media on vertical accountability is overwhelmingly significant except for slight cases and remains positive. Considering the effect of education quality on vertical accountability, the following outcomes are established. First, as regards Panel A reflecting tertiary school enrolment, only estimates from OLS and 90th quantile are significant and positive. Second, in Panel B on secondary school enrolment, OLS, 30th, from 50th to 90th quantile estimates are positively significant. Third, in Panel C on primary school enrolment, none of the results is significant.

With the findings from Table 3 on the connection between education quality, social media and horizontal accountability, it is established that social media still maintains the positive effects

and it is simultaneously significant for most specifications. Moving towards the nexus of education quality, it is evident that, first from Panel A on tertiary school enrolment, the intercept is positively significant for OLS estimation and exclusively significant in the bottom (i.e., from 10th to 30th) and top (90th) quantiles. Second, in Panel B for secondary school enrolment, the result reveals positively significant intercepts for OLS estimate, 20th, and from 60th to 90th quantiles. Third, in Panel C for primary school enrolment, the nexus remains insignificant for all the specifications.

The subsequent results are apparent from Table 4 on the influence of education quality and social media on diagonal accountability. Except for few specifications, the nexus with social media remains overwhelmingly significant and positive. As regards the connection of education quality, the concurrent results are emphasized. First, from Panel A on tertiary school enrolment, the intercept is positively significant for the OLS estimate whereas it is not significant for quantile regressions. Second, in Panel B on secondary school enrolment, the OLS estimate is insignificant while the estimates are positive and significant with the 60th and 90th quantiles. Third, the linkage of primary school enrolment from Panel C remains insignificant for all the specifications.

The corresponding findings can be documented from Table 5 relating to the nexuses between education quality, social media and judicial accountability. Overall, the effect of social media on judicial accountability is significantly positive for most specifications including OLS estimate. As regards the effect of education quality, the following findings are known. First, in Panel A relating to tertiary school enrolment, none of specifications is respectively are significant. Second, in Panel B on secondary school enrolment, the outcomes from both techniques also report insignificant intercepts. Third, in Panel C relating to primary school enrolment, only 40th quantile remains positively significant.

3.2 Robustness check

The study further performs the robustness analysis to validate the reliability of the baseline findings of the study. Accordingly, this section aims to assess whether the established positive relationship between education, social media and accountability would withstand pragmatic scrutiny when a new set of accountability variable is employed. The findings from Table 6

attempt to replicate the regression performed in prior empirical analyses using an alternative measure for public accountability. The alternative measure is extracted from World Governance Indicators of World Bank database. The measure adopted is "Voice and Accountability" which measures the extent of citizens' participations in the government selection. This pattern creates room for more policy implications. The choice of the measure is consistent with extant of literature on governance (Asongu & Nwachukwu, 2016; Asongu & Odhiambo, 2019b; Bird et al., 2008; Ojeka et al., 2019).

In light of the above, the following outcomes are established from Table 6 that is based on voice and accountability. The results are seemingly closed with findings in Table 1. For emphasize, the nexus of social media is overwhelmingly significant and remains positive for all specifications. Looking at the outcome of education quality, the following findings are recognized. First, in Panel A relating to tertiary school enrolment, the results from OLS, 10th, 40th, 50th, 60th & 90th quantile respectively are positively significant. Second, in Panel B on secondary school enrolment, the outcomes from both techniques are positively significant from 30th to 90th quantile. Third, in Panel C relating to primary school enrolment, both techniques remain insignificant all through.

Concluding consequences and future research prospects

The study has examined nexuses between social media (within the remit of Facebook penetration), educational quality and public accountability dynamics. The study focuses on 168 countries and the empirical evidence is based on Ordinary Least Squares (OLS) and quantile regressions. While the former empirical strategy provides baseline estimates, the latter articulates initial levels of public accountability by considering the nexuses throughout the conditional distribution of public accountability. The main finding is that there is an overwhelming positive connection between Facebook penetration and accountability dynamics (general accountability; vertical accountability; horizontal accountability; diagonal accountability; judicial accountability) from the Varieties of Democracy (V-Dem) database. These findings withstand empirical scrutiny when the voice and accountability indicator from World Governance Indicators of the World Bank is used for robustness checks.

The findings have implications for the continued role of social media in contributing towards the demand for better public accountability in the world. However, this inference should be taken with caution because social media can also be employed to undermine public accountability, especially within the remit of recruiting fake and instrumented civil society members and organizations for the purpose of stifling measures that promote and demand public accountability. Hence, it would be relevant to improve the established findings with panel data and corresponding analytical techniques that reflect causality instead of correlations or relationships.

Another worthwhile implication is that education quality within the remit of gender-inclusive education is positively related to public accountability. It follows that promoting female education and by extension, female economic and political participation are positive steps towards promoting public accountability. However, as highlighted in the previous paragraph, it is worthwhile for this inference to be confirmed within the premise of a more robust empirical exercise that is causality-centric.

Beyond the discussed caveats, it is worthwhile to also acknowledge that owing the data availability constraints at the time of the study, only Facebook penetration was used as a proxy for social media. Hence, this study obviously leaves room for other social media proxies to be considered within the same analytical scope.

Table 1: Education, social media and accountability index

	Dependent Variable: Accountability Index									
	OLS	**0.10**	**0.20**	**0.30**	**0.40**	**0.50**	**0.60**	**0.70**	**0.80**	**0.90**
	Panel A: School Enrolment - Tertiary and Facebook Penetration									
Media	0.0273***	0.0282***	0.0287**	0.0307***	0.0308***	0.0285***	0.0192***	0.0126**	0.00921***	0.00930***
	(0.00547)	(0.0105)	(0.0142)	(0.0100)	(0.00795)	(0.00683)	(0.00678)	(0.00515)	(0.00346)	(0.00342)
Tertiary	0.00867**	0.0174***	0.0110	0.0115*	0.0117**	0.00548	0.00718*	0.00501	0.00307	0.00146
	(0.00332)	(0.00639)	(0.00860)	(0.00607)	(0.00482)	(0.00414)	(0.00411)	(0.00312)	(0.00210)	(0.00207)
Urban	-0.0150***	-0.0263***	-0.0153	-0.0193**	-0.0187***	-0.00892	-0.00400	0.0000545	0.00381	0.00496*
	(0.00474)	(0.00912)	(0.0123)	(0.00868)	(0.00688)	(0.00592)	(0.00587)	(0.00446)	(0.00300)	(0.00296)
GDP	-0.0327	-0.0825*	-0.0646	-0.0264	-0.0134	-0.0319	-0.0236	-0.0109	-0.0178	-0.00646
	(0.0224)	(0.0432)	(0.0581)	(0.0410)	(0.0326)	(0.0280)	(0.0278)	(0.0211)	(0.0142)	(0.0140)
Trade	-0.000195	-0.000755	-0.00007	-0.000611	-0.000883	-0.000653	0.0000953	-0.000552	-0.000374	-0.000705
	(0.00110)	(0.00212)	(0.00285)	(0.00201)	(0.00160)	(0.00137)	(0.00136)	(0.00104)	(0.000695)	(0.000687)
Constant	0.895***	0.400	0.345	0.825**	0.854**	0.745***	0.696**	0.924***	0.954***	1.056***
	(0.226)	(0.434)	(0.585)	(0.413)	(0.328)	(0.282)	(0.279)	(0.212)	(0.143)	(0.141)
Adjusted R^2	0.424	--	--	--	--	--	--	--	--	--
Fisher	15.19***	--	--	--	--	--	--	--	--	--
Pseudo R^2	--	0.243	0.241	0.390	0.526	0.624	0.617	0.759	0.986	0.748
Observations	109	109	109	109	109	109	109	109	109	109

	OLS	**0.10**	**0.20**	**0.30**	**0.40**	**0.50**	**0.60**	**0.70**	**0.80**	**0.90**
	Panel B: School Enrolment - Secondary and Facebook Penetration									
Media	0.0239***	0.0216**	0.0175*	0.0182*	0.0246***	0.0248***	0.0252***	0.0138***	0.0107***	0.0101***
	(0.00509)	(0.0108)	(0.0101)	(0.0106)	(0.00759)	(0.00669)	(0.00513)	(0.00510)	(0.00405)	(0.00379)
Secondary	0.00649**	0.00627	0.00854	0.0110	0.0102**	0.00635	0.00609*	0.00913***	0.00636**	0.00545**
	(0.00321)	(0.00678)	(0.00638)	(0.00667)	(0.00478)	(0.00422)	(0.00324)	(0.00321)	(0.00255)	(0.00239)
Urban	-0.00946**	-0.00935	-0.0112	-0.00947	-0.0108	-0.00712	-0.00995**	-0.00275	0.00123	0.000571
	(0.00442)	(0.00934)	(0.00879)	(0.00919)	(0.00659)	(0.00581)	(0.00446)	(0.00443)	(0.00352)	(0.00329)
GDP	-0.0435**	-0.146***	-0.117***	-0.0881*	-0.0320	-0.0287	-0.0434**	-0.00160	-0.0148	-0.00257
	(0.0215)	(0.0454)	(0.0427)	(0.0446)	(0.0320)	(0.0282)	(0.0217)	(0.0215)	(0.0171)	(0.0160)
Trade	-0.00128	-0.00488**	-0.00296	-0.000994	-0.00175	-0.00124	-0.00126	-0.000927	-0.000652	-0.000694
	(0.000990)	(0.00209)	(0.00197)	(0.00206)	(0.00148)	(0.00130)	(0.000998)	(0.000991)	(0.000787)	(0.000737)
Constant	0.614**	0.342	0.474	0.214	0.392	0.546*	0.886***	0.519**	0.680***	0.903***
	(0.242)	(0.512)	(0.482)	(0.503)	(0.361)	(0.318)	(0.244)	(0.243)	(0.192)	(0.180)
Adjusted R^2	0.432	--	--	--	--	--	--	--	--	--
Fisher	15.20***	--	--	--	--	--	--	--	--	--
Pseudo R^2	--	0.240	0.340	0.372	0.555	0.643	0.821	0.773	0.850	0.680
Observations	106	106	106	106	106	106	106	106	106	106

	OLS	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90
					Panel C: School Enrolment - Primary and Facebook Penetration					
Media	0.0317***	0.0294**	0.0279***	0.0401***	0.0387***	0.0341***	0.0295***	0.0196***	0.0130***	0.0127***
	(0.00515)	(0.0146)	(0.00937)	(0.0101)	(0.00818)	(0.00695)	(0.00518)	(0.00472)	(0.00296)	(0.00328)
Primary	0.00375	0.00414	0.00599	-0.00136	0.000287	0.000544	0.00227	0.000830	-0.000634	-0.00114
	(0.00506)	(0.0143)	(0.00920)	(0.00992)	(0.00804)	(0.00683)	(0.00509)	(0.00464)	(0.00291)	(0.00322)
Urban	-0.0106**	-0.0171	-0.0137*	-0.0162*	-0.0145**	-0.0114*	-0.00599	0.00143	0.00499**	0.00564**
	(0.00427)	(0.0121)	(0.00778)	(0.00838)	(0.00679)	(0.00577)	(0.00430)	(0.00392)	(0.00246)	(0.00272)
GDP	-0.0352	-0.106*	-0.116***	-0.0561	-0.0441	-0.0323	-0.0243	-0.0173	-0.0159	-0.00541
	(0.0218)	(0.0616)	(0.0396)	(0.0427)	(0.0346)	(0.0294)	(0.0219)	(0.0199)	(0.0125)	(0.0139)
Trade	-0.00128	-0.000536	-0.00219	-0.00129	-0.00172	-0.00119	-0.000974	-0.000580	-0.000460	-0.00107
	(0.00113)	(0.00319)	(0.00205)	(0.00221)	(0.00179)	(0.00152)	(0.00113)	(0.00103)	(0.000647)	(0.000717)
Constant	0.573	0.106	0.235	1.036	1.078	1.059	0.727	0.819	0.992***	1.134***
	(0.601)	(1.702)	(1.094)	(1.179)	(0.955)	(0.811)	(0.604)	(0.551)	(0.345)	(0.383)
Adjusted R^2	0.334	--	--	--	--	--	--	--	--	--
Fisher	12.56***	--	--	--	--	--	--	--	--	--
Pseudo R^2	--	0.151	0.314	0.333	0.440	0.528	0.695	0.713	0.993	0.672
Observations	131	131	131	131	131	131	131	131	131	131

Abbreviation. Media – Facebook penetration; Tertiary – Tertiary school enrollment; Secondary – Secondary school enrollment; Primary – Primary school enrollment; Urban – Urbanization; Trade -Trade openness. OLS – Ordinary least square. Adjusted R^2 for OLS and Pseudo R^2 for quartile regression. For instance, Lower quantile (e.g., Q.10) signifies nations whose public accountability is least while Highest quantile (e.g., Q.90) reveals countries where public accountability is maximal

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 2: Education, social media and vertical accountability

	Dependent Variable: Vertical Accountability									
	OLS	**0.10**	**0.20**	**0.30**	**0.40**	**0.50**	**0.60**	**0.70**	**0.80**	**0.90**
	Panel A: School Enrolment - Tertiary and Facebook Penetration									
Media	0.00642***	0.00959**	0.00648*	0.00631***	0.00614***	0.00546***	0.00364***	0.00271***	0.00130*	0.000781
	(0.00142)	(0.00483)	(0.00376)	(0.00224)	(0.00191)	(0.00160)	(0.00131)	(0.000964)	(0.000661)	(0.000613)
Tertiary	0.00202**	0.00405	0.00320	0.00208	0.00178	0.00133	0.00108	0.000509	0.000979**	0.000472
	(0.000861)	(0.00293)	(0.00228)	(0.00136)	(0.00116)	(0.000972)	(0.000797)	(0.000584)	(0.000401)	(0.000371)
Urban	-0.0039***	-0.00877**	-0.00309	-0.00274	-0.00270	-0.00220	-0.00117	-0.000480	0.0000733	0.000235
	(0.00123)	(0.00418)	(0.00325)	(0.00194)	(0.00166)	(0.00139)	(0.00114)	(0.000835)	(0.000572)	(0.000530)
GDP	-0.00332	-0.0233	-0.00292	-0.00492	-0.00198	-0.00167	-0.00223	-0.00146	-0.00123	-0.000789
	(0.00582)	(0.0198)	(0.0154)	(0.00919)	(0.00784)	(0.00657)	(0.00538)	(0.00395)	(0.00271)	(0.00251)
Trade	0.000202	0.000744	0.000110	0.0000838	-0.000119	0.0000194	0.0000624	0.000112	0.000149	0.0000324
	(0.000285)	(0.000970)	(0.000755)	(0.000451)	(0.000385)	(0.000322)	(0.000264)	(0.000194)	(0.000133)	(0.000123)
Constant	0.764***	0.625***	0.568***	0.663***	0.732***	0.762***	0.781***	0.814***	0.802***	0.860***
	(0.0586)	(0.199)	(0.155)	(0.0925)	(0.0789)	(0.0661)	(0.0542)	(0.0397)	(0.0273)	(0.0253)
Adjusted R^2	0.347	--	--	--	--	--	--	--	--	--
Fisher	10.94***	--	--	--	--	--	--	--	--	--
Pseudo R^2	--	0.530	0.909	1.743	2.184	2.661	3.180	4.055	5.163	4.179
Observations	109	109	109	109	109	109	109	109	109	109
	OLS	**0.10**	**0.20**	**0.30**	**0.40**	**0.50**	**0.60**	**0.70**	**0.80**	**0.90**
	Panel B: School Enrolment - Secondary and Facebook Penetration									
Media	0.00456***	0.00633*	0.00416	0.00411**	0.00520***	0.00296**	0.00316***	0.00220**	0.00149**	0.00105**
	(0.00111)	(0.00372)	(0.00260)	(0.00180)	(0.00166)	(0.00129)	(0.00103)	(0.000883)	(0.000675)	(0.000448)
Secondary	0.00172**	0.00165	0.00265	0.00251**	0.00157	0.00149*	0.00175***	0.00156***	0.00128***	0.00124***
	(0.000698)	(0.00234)	(0.00164)	(0.00114)	(0.00105)	(0.000810)	(0.000650)	(0.000556)	(0.000425)	(0.000282)
Urban	-0.00144	-0.00305	-0.00112	-0.00171	-0.00200	-0.000432	-0.000865	-0.000368	-0.000162	-0.0000354
	(0.000962)	(0.00323)	(0.00226)	(0.00157)	(0.00145)	(0.00112)	(0.000896)	(0.000767)	(0.000586)	(0.000389)
GDP	-0.00386	-0.0225	-0.0154	-0.00773	-0.00761	-0.00713	-0.00114	-0.00120	0.000958	0.000273
	(0.00467)	(0.0157)	(0.0110)	(0.00761)	(0.00703)	(0.00542)	(0.00435)	(0.00373)	(0.00285)	(0.00189)
Trade	-0.000127	-0.000238	-0.000449	-0.000248	-0.000211	0.0000094	-0.000056	0.0000176	0.0000021	-0.0000394
	(0.000215)	(0.000723)	(0.000505)	(0.000350)	(0.000324)	(0.000250)	(0.000200)	(0.000172)	(0.000131)	(0.0000871)
Constant	0.646***	0.569***	0.522***	0.593***	0.694***	0.671***	0.693***	0.711***	0.762***	0.786***
	(0.0526)	(0.177)	(0.123)	(0.0857)	(0.0792)	(0.0611)	(0.0490)	(0.0420)	(0.0321)	(0.0213)
Adjusted R^2	0.413	--	--	--	--	--	--	--	--	--
Fisher	14.10***	--	--	--	--	--	--	--	--	--
Pseudo R^2	--	0.694	1.324	2.187	2.530	3.345	4.085	4.462	5.097	5.756
Observations	106	106	106	106	106	106	106	106	106	106

	OLS	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90
Panel C: School Enrolment - Primary and Facebook Penetration										
Media	0.00725***	0.00889*	0.00706**	0.00809***	0.00680***	0.00615***	0.00508***	0.00330***	0.00252***	0.00161***
	(0.00128)	(0.00499)	(0.00341)	(0.00170)	(0.00168)	(0.00128)	(0.00103)	(0.000860)	(0.000642)	(0.000542)
Primary	0.0000346	-0.00226	0.00164	-0.000230	0.000242	-0.000406	0.000338	-0.000161	-0.000209	0.000613
	(0.00126)	(0.00490)	(0.00335)	(0.00166)	(0.00165)	(0.00126)	(0.00101)	(0.000844)	(0.000630)	(0.000532)
Urban	-0.00243**	-0.00776*	-0.00108	-0.00121	-0.00172	-0.00165	-0.000983	-0.000105	0.000408	0.000859*
	(0.00106)	(0.00414)	(0.00283)	(0.00141)	(0.00139)	(0.00106)	(0.000855)	(0.000714)	(0.000533)	(0.000450)
GDP	-0.00359	-0.0294	-0.0151	-0.000116	-0.00450	-0.00572	-0.00373	-0.00383	-0.00245	-0.000232
	(0.00540)	(0.0211)	(0.0144)	(0.00716)	(0.00709)	(0.00542)	(0.00435)	(0.00363)	(0.00271)	(0.00229)
Trade	-0.000067	0.000898	-0.000392	-0.000237	-0.000074	-0.000034	-0.000045	-0.000035	0.0000849	0.000059
	(0.000279)	(0.00109)	(0.000745)	(0.000370)	(0.000367)	(0.000280)	(0.000225)	(0.000188)	(0.000140)	(0.000118)
Constant	0.754***	0.942	0.461	0.663***	0.725***	0.827***	0.756***	0.825***	0.824***	0.757***
	(0.149)	(0.582)	(0.398)	(0.198)	(0.196)	(0.150)	(0.120)	(0.100)	(0.0749)	(0.0632)
Adjusted R^2	0.280	--	--	--	--	--	--	--	--	--
Fisher	9.722***	--	--	--	--	--	--	--	--	--
Pseudo R^2	--	0.442	0.861	1.986	2.144	2.865	3.495	3.916	4.579	4.068
Observations	131	131	131	131	131	131	131	131	131	131

Abbreviation. Media – Facebook penetration; Tertiary – Tertiary school enrollment; Secondary – Secondary school enrollment; Primary – Primary school enrollment; Urban – Urbanization; Trade -Trade openness. OLS – Ordinary least square. Adjusted R^2 for OLS and Pseudo R^2 for quartile regression. For instance, Lower quantile (e.g., Q.10) signifies nations whose public accountability is least while Highest quantile (e.g., Q.90) reveals countries where public accountability is maximal

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 3: Education, social media and horizontal accountability

	Dependent Variable: Horizontal Accountability									
	OLS	**0.10**	**0.20**	**0.30**	**0.40**	**0.50**	**0.60**	**0.70**	**0.80**	**0.90**
	Panel A: School Enrolment - Tertiary and Facebook Penetration									
Media	0.0101***	0.0102***	0.0126***	0.0136***	0.0128***	0.0101***	0.00423	0.00244	0.00176	0.00109
	(0.00203)	(0.00332)	(0.00297)	(0.00324)	(0.00351)	(0.00344)	(0.00322)	(0.00193)	(0.00109)	(0.000789)
Tertiary	0.00246**	0.00405**	0.00457**	0.00357*	0.00220	0.00174	0.00201	0.00138	0.000817	0.000881*
	(0.00123)	(0.00201)	(0.00180)	(0.00197)	(0.00213)	(0.00209)	(0.00195)	(0.00117)	(0.000660)	(0.000478)
Urban	-0.0062***	-0.0085***	-0.0085***	-0.0078***	-0.00668**	-0.00498*	-0.000961	-0.000183	-0.000308	0.0000628
	(0.00176)	(0.00288)	(0.00257)	(0.00281)	(0.00304)	(0.00298)	(0.00279)	(0.00167)	(0.000943)	(0.000683)
GDP	-0.0120	-0.0346**	-0.0140	-0.0106	-0.0177	-0.00220	-0.00350	-0.00116	-0.00191	-0.00101
	(0.00832)	(0.0136)	(0.0121)	(0.0133)	(0.0144)	(0.0141)	(0.0132)	(0.00791)	(0.00446)	(0.00323)
Trade	-0.000077	0.000299	0.000116	-0.000132	-0.000368	-0.000542	-0.000003	0.000151	0.00000045	-0.0000105
	(0.000408)	(0.000667)	(0.000596)	(0.000651)	(0.000705)	(0.000692)	(0.000648)	(0.000388)	(0.000219)	(0.000159)
Constant	0.751***	0.519***	0.525***	0.584***	0.691***	0.782***	0.693***	0.751***	0.852***	0.855***
	(0.0837)	(0.137)	(0.122)	(0.134)	(0.145)	(0.142)	(0.133)	(0.0796)	(0.0449)	(0.0325)
Adjusted R^2	0.368	--	--	--	--	--	--	--	--	--
Fisher	11.99***	--	--	--	--	--	--	--	--	--
Pseudo R^2	--	0.771	1.151	1.206	1.191	1.239	1.296	2.025	3.135	3.244
Observations	109	109	109	109	109	109	109	109	109	109

	OLS	**0.10**	**0.20**	**0.30**	**0.40**	**0.50**	**0.60**	**0.70**	**0.80**	**0.90**
	Panel B: School Enrolment - Secondary and Facebook Penetration									
Media	0.00891***	0.00874***	0.00759**	0.00984***	0.00907**	0.00697**	0.00454*	0.00281**	0.00319***	0.00142
	(0.00194)	(0.00327)	(0.00308)	(0.00357)	(0.00360)	(0.00316)	(0.00253)	(0.00117)	(0.000863)	(0.00107)
Secondary	0.00227*	0.00302	0.00342*	0.00359	0.00365	0.00285	0.00273*	0.00255***	0.00186***	0.00174**
	(0.00122)	(0.00206)	(0.00194)	(0.00225)	(0.00227)	(0.00199)	(0.00159)	(0.000740)	(0.000544)	(0.000674)
Urban	-0.0049***	-0.00741**	-0.00526*	-0.00466	-0.00403	-0.00398	-0.00268	-0.00125	-0.00124	-0.000227
	(0.00168)	(0.00284)	(0.00268)	(0.00310)	(0.00313)	(0.00274)	(0.00220)	(0.00102)	(0.000749)	(0.000929)
GDP	-0.0199**	-0.0487***	-0.0483***	-0.0317**	-0.0184	-0.0116	-0.00536	-0.00167	-0.00157	0.00171
	(0.00818)	(0.0138)	(0.0130)	(0.0151)	(0.0152)	(0.0133)	(0.0107)	(0.00496)	(0.00364)	(0.00451)
Trade	-0.000392	-0.000267	0.0000529	-0.000403	-0.000595	-0.000697	-0.000508	-0.000075	-0.0000944	-0.000159
	(0.000377)	(0.000636)	(0.000599)	(0.000694)	(0.000699)	(0.000614)	(0.000492)	(0.000228)	(0.000168)	(0.000208)
Constant	0.661***	0.475***	0.421***	0.413**	0.458***	0.688***	0.700***	0.671***	0.738***	0.764***
	(0.0922)	(0.156)	(0.147)	(0.170)	(0.171)	(0.150)	(0.120)	(0.0559)	(0.0410)	(0.0508)
Adjusted R^2	0.387	--	--	--	--	--	--	--	--	--
Fisher	12.62***	--	--	--	--	--	--	--	--	--
Pseudo R^2	--	0.788	1.116	1.104	1.171	1.361	1.666	3.354	3.988	2.413
Observations	106	106	106	106	106	106	106	106	106	106

	OLS	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90
					Panel C: School Enrolment - Primary and Facebook Penetration					
Media	0.0109***	0.00950***	0.0145***	0.0138***	0.0153***	0.0111***	0.00835***	0.00476***	0.00263**	0.00203***
	(0.00186)	(0.00335)	(0.00389)	(0.00408)	(0.00341)	(0.00280)	(0.00273)	(0.00166)	(0.00106)	(0.000706)
Primary	0.000826	-0.000266	0.00262	0.00158	-0.00120	0.000211	0.000575	0.000134	0.000364	0.000540
	(0.00183)	(0.00329)	(0.00382)	(0.00401)	(0.00335)	(0.00275)	(0.00268)	(0.00163)	(0.00104)	(0.000693)
Urban	-0.0049***	-0.00534*	-0.00373	-0.00295	-0.00667**	-0.00432*	-0.00304	-0.000913	-0.000267	-0.0000037
	(0.00154)	(0.00278)	(0.00323)	(0.00339)	(0.00283)	(0.00232)	(0.00226)	(0.00138)	(0.000879)	(0.000586)
GDP	-0.0153*	-0.0452***	-0.0124	-0.0262	-0.0157	-0.0113	-0.00725	-0.00281	-0.00269	-0.00601**
	(0.00786)	(0.0142)	(0.0164)	(0.0172)	(0.0144)	(0.0118)	(0.0115)	(0.00702)	(0.00448)	(0.00298)
Trade	-0.000386	-0.000412	-0.000285	-0.000756	-0.000532	-0.000781	-0.000367	-0.000027	-0.000128	-0.000116
	(0.000407)	(0.000732)	(0.000851)	(0.000891)	(0.000745)	(0.000611)	(0.000595)	(0.000363)	(0.000231)	(0.000154)
Constant	0.701***	0.577	0.126	0.371	0.883**	0.828**	0.789**	0.802***	0.839***	0.843***
	(0.217)	(0.391)	(0.454)	(0.476)	(0.398)	(0.326)	(0.318)	(0.194)	(0.124)	(0.0824)
Adjusted R^2	0.298	--	--	--	--	--	--	--	--	--
Fisher	10.61***	--	--	--	--	--	--	--	--	--
Pseudo R^2	--	0.657	0.755	0.825	1.055	1.313	1.321	2.025	2.774	3.122
Observations	131	131	131	131	131	131	131	131	131	131

Abbreviation. Media – Facebook penetration; Tertiary – Tertiary school enrollment; Secondary – Secondary school enrollment; Primary – Primary school enrollment; Urban – Urbanization; Trade -Trade openness. OLS – Ordinary least square. Adjusted R^2 for OLS and Pseudo R^2 for quartile regression. For instance, Lower quantile (e.g., Q.10) signifies nations whose public accountability is least while Highest quantile (e.g., Q.90) reveals countries where public accountability is maximal

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4: Education, social media and diagonal accountability

	Dependent Variable: Diagonal Accountability									
	OLS	**0.10**	**0.20**	**0.30**	**0.40**	**0.50**	**0.60**	**0.70**	**0.80**	**0.90**
	Panel A: School Enrolment - Tertiary and Facebook Penetration									
Media	0.00650***	0.00899**	0.00961**	0.00708	0.00481*	0.00340*	0.00252**	0.00162	0.00100	0.000450
	(0.00175)	(0.00353)	(0.00448)	(0.00436)	(0.00277)	(0.00172)	(0.00115)	(0.00101)	(0.000740)	(0.000426)
Tertiary	0.00195*	0.00312	0.00314	0.00225	0.00166	0.00112	0.000989	0.000780	0.000433	0.000353
	(0.00106)	(0.00214)	(0.00271)	(0.00264)	(0.00168)	(0.00105)	(0.000696)	(0.000615)	(0.000449)	(0.000259)
Urban	-0.0045***	-0.0088***	-0.00575	-0.00368	-0.00287	-0.00109	-0.000771	-0.00003	0.000349	0.000457
	(0.00151)	(0.00306)	(0.00388)	(0.00377)	(0.00240)	(0.00149)	(0.000994)	(0.000879)	(0.000641)	(0.000369)
GDP	-0.0109	-0.0401***	-0.0158	-0.00677	-0.00324	-0.00290	-0.00331	-0.00298	-0.00122	-0.00100
	(0.00716)	(0.0145)	(0.0183)	(0.0178)	(0.0113)	(0.00706)	(0.00470)	(0.00416)	(0.00303)	(0.00175)
Trade	0.0000067	-0.000113	-0.000180	-0.000037	-0.000120	0.0000923	0.0000347	-0.000058	-0.0000127	-0.0000216
	(0.000351)	(0.000710)	(0.000899)	(0.000876)	(0.000556)	(0.000346)	(0.000231)	(0.000204)	(0.000149)	(0.0000857)
Constant	0.835***	0.722***	0.662***	0.719***	0.826***	0.788***	0.826***	0.839***	0.866***	0.892***
	(0.0721)	(0.146)	(0.185)	(0.180)	(0.114)	(0.0711)	(0.0473)	(0.0418)	(0.0305)	(0.0176)
Adjusted R^2	0.274	--	--	--	--	--	--	--	--	--
Fisher	7.771***	--	--	--	--	--	--	--	--	--
Pseudo R^2	--	0.725	0.763	0.897	1.511	2.474	3.640	3.853	4.611	6.002
Observations	109	109	109	109	109	109	109	109	109	109

	OLS	**0.10**	**0.20**	**0.30**	**0.40**	**0.50**	**0.60**	**0.70**	**0.80**	**0.90**
	Panel B: School Enrolment - Secondary and Facebook Penetration									
Media	0.00616***	0.00660*	0.00437	0.00368	0.00314	0.00314*	0.00309***	0.00133	0.000881	0.000520
	(0.00163)	(0.00394)	(0.00419)	(0.00350)	(0.00269)	(0.00159)	(0.00107)	(0.000984)	(0.000608)	(0.000359)
Secondary	0.000407	0.00151	0.00280	0.00213	0.00151	0.00132	0.00116*	0.000861	0.000509	0.000395*
	(0.00103)	(0.00248)	(0.00264)	(0.00220)	(0.00170)	(0.00100)	(0.000676)	(0.000620)	(0.000383)	(0.000226)
Urban	-0.00293**	-0.00380	-0.00330	-0.00167	-0.00146	-0.00152	-0.00117	0.000240	0.000427	0.000168
	(0.00142)	(0.00342)	(0.00364)	(0.00304)	(0.00234)	(0.00138)	(0.000932)	(0.000855)	(0.000528)	(0.000312)
GDP	-0.0146**	-0.0434**	-0.0319*	-0.0184	-0.00954	-0.00600	-0.000984	-0.00208	-0.000687	-0.00137
	(0.00689)	(0.0166)	(0.0177)	(0.0148)	(0.0114)	(0.00670)	(0.00453)	(0.00415)	(0.00256)	(0.00152)
Trade	-0.000235	-0.00132*	-0.000399	-0.0000897	-0.000208	-0.000259	-0.000245	-0.000135	-0.0000511	-0.000078
	(0.000317)	(0.000765)	(0.000815)	(0.000680)	(0.000523)	(0.000309)	(0.000209)	(0.000191)	(0.000118)	(0.0000698)
Constant	0.834***	0.669***	0.594***	0.634***	0.754***	0.800***	0.806***	0.803***	0.844***	0.901***
	(0.0776)	(0.187)	(0.199)	(0.166)	(0.128)	(0.0755)	(0.0510)	(0.0468)	(0.0289)	(0.0171)
Adjusted R^2	0.252	--	--	--	--	--	--	--	--	--
Fisher	6.724***	--	--	--	--	--	--	--	--	--
Pseudo R^2	--	0.655	0.820	1.127	1.566	2.707	3.927	4.003	5.662	7.181
Observations	106	106	106	106	106	106	106	106	106	106

	OLS	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90
					Panel C: School Enrolment - Primary and Facebook Penetration					
Media	0.00745***	0.00991**	0.00833**	0.00768**	0.00577**	0.00395**	0.00292***	0.00174**	0.00160**	0.00101***
	(0.00160)	(0.00467)	(0.00407)	(0.00315)	(0.00277)	(0.00184)	(0.000955)	(0.000840)	(0.000612)	(0.000253)
Primary	0.000984	0.0000679	0.00360	0.00106	-0.000617	-0.000624	-0.000186	-0.000299	0.000816	0.000223
	(0.00157)	(0.00458)	(0.00399)	(0.00309)	(0.00272)	(0.00181)	(0.000938)	(0.000825)	(0.000601)	(0.000248)
Urban	-0.0038***	-0.00757*	-0.00332	-0.00345	-0.00253	-0.000735	-0.000348	0.000465	0.000202	0.000499**
	(0.00133)	(0.00387)	(0.00338)	(0.00261)	(0.00230)	(0.00153)	(0.000792)	(0.000697)	(0.000508)	(0.000210)
GDP	-0.0113*	-0.0441**	-0.0329*	-0.0268**	-0.0136	-0.00499	-0.00481	-0.00375	-0.00303	-0.000521
	(0.00677)	(0.0197)	(0.0172)	(0.0133)	(0.0117)	(0.00779)	(0.00403)	(0.00355)	(0.00259)	(0.00107)
Trade	-0.000268	-0.000162	-0.00126	-0.000612	-0.000163	-0.0000687	-0.000104	-0.000123	-0.0000659	-0.000110**
	(0.000350)	(0.00102)	(0.000889)	(0.000688)	(0.000604)	(0.000403)	(0.000209)	(0.000184)	(0.000134)	(0.0000552)
Constant	0.770***	0.737	0.402	0.726*	0.932***	0.895***	0.876***	0.886***	0.805***	0.882***
	(0.187)	(0.544)	(0.475)	(0.367)	(0.323)	(0.215)	(0.111)	(0.0980)	(0.0715)	(0.0295)
Adjusted R^2	0.205	--	--	--	--	--	--	--	--	--
Fisher	6.454	--	--	--	--	--	--	--	--	--
Pseudo R^2	--	0.472	0.723	1.069	1.301	1.991	3.770	4.008	4.800	8.728
Observations	131	131	131	131	131	131	131	131	131	131

Abbreviation. Media – Facebook penetration; Tertiary – Tertiary school enrollment; Secondary – Secondary school enrollment; Primary – Primary school enrollment; Urban – Urbanization; Trade -Trade openness. OLS – Ordinary least square. Adjusted R^2 for OLS and Pseudo R^2 for quartile regression. For instance, Lower quantile (e.g., Q.10) signifies nations whose public accountability is least while Highest quantile (e.g., Q.90) reveals countries where public accountability is maximal

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5: Education, social media and judicial accountability

	Dependent Variable: Judicial Accountability									
	OLS	**0.10**	**0.20**	**0.30**	**0.40**	**0.50**	**0.60**	**0.70**	**0.80**	**0.90**
	Panel A: School Enrolment - Tertiary and Facebook Penetration									
Media	0.0209***	0.00904	0.0235*	0.0256*	0.0234**	0.0182**	0.0193**	0.0231***	0.0231***	0.0218***
	(0.00653)	(0.0101)	(0.0129)	(0.0129)	(0.0108)	(0.00911)	(0.00906)	(0.00769)	(0.00647)	(0.00513)
Tertiary	0.00202	0.00314	0.00492	0.00224	0.00385	0.00313	0.00213	0.000236	0.000677	0.000884
	(0.00396)	(0.00612)	(0.00784)	(0.00782)	(0.00657)	(0.00552)	(0.00549)	(0.00466)	(0.00392)	(0.00311)
Urban	-0.00126	-0.00441	-0.0110	0.00243	0.00280	0.000561	0.00242	0.000838	-0.00188	-0.00198
	(0.00566)	(0.00874)	(0.0112)	(0.0112)	(0.00938)	(0.00789)	(0.00784)	(0.00666)	(0.00560)	(0.00444)
GDP	-0.0155	0.00333	-0.0276	-0.0219	-0.0105	-0.0391	-0.0192	-0.0126	0.0140	0.0243
	(0.0268)	(0.0413)	(0.0530)	(0.0528)	(0.0444)	(0.0373)	(0.0371)	(0.0315)	(0.0265)	(0.0210)
Trade	0.000249	-0.000176	-0.000166	-0.000266	0.00175	0.00173	0.00103	-0.000186	0.0000988	-0.000237
	(0.00131)	(0.00203)	(0.00260)	(0.00259)	(0.00218)	(0.00183)	(0.00182)	(0.00155)	(0.00130)	(0.00103)
Constant	1.685***	0.963**	1.373**	1.118**	1.047**	1.612***	1.719***	2.173***	2.421***	2.621***
	(0.269)	(0.416)	(0.533)	(0.532)	(0.447)	(0.375)	(0.373)	(0.317)	(0.267)	(0.211)
Adjusted R^2	0.262	--	--	--	--	--	--	--	--	--
Fisher	7.314***	--	--	--	--	--	--	--	--	--
Pseudo R^2	--	0.254	0.264	0.303	0.386	0.468	0.462	0.508	0.528	0.499
Observations	109	109	109	109	109	109	109	109	109	109

	OLS	**0.10**	**0.20**	**0.30**	**0.40**	**0.50**	**0.60**	**0.70**	**0.80**	**0.90**
	Panel B: School Enrolment - Secondary and Facebook Penetration									
Media	0.0206***	0.0170	0.0207*	0.0200	0.0227**	0.0180	0.0202**	0.0212**	0.0214***	0.0167***
	(0.00675)	(0.0112)	(0.0122)	(0.0126)	(0.0110)	(0.0109)	(0.00914)	(0.00851)	(0.00734)	(0.00598)
Secondary	0.00501	0.00153	0.00478	0.00486	0.00642	0.00350	0.00303	-0.000463	0.00325	0.00370
	(0.00425)	(0.00708)	(0.00768)	(0.00796)	(0.00694)	(0.00689)	(0.00576)	(0.00536)	(0.00463)	(0.00377)
Urban	-0.00671	-0.00728	-0.0101	-0.0116	-0.00105	0.00183	0.000264	-0.000560	-0.00435	-0.00169
	(0.00586)	(0.00975)	(0.0106)	(0.0110)	(0.00957)	(0.00949)	(0.00794)	(0.00739)	(0.00638)	(0.00520)
GDP	-0.0305	0.00713	-0.0692	-0.0961*	-0.0321	-0.0165	-0.0174	-0.0277	0.00364	0.00903
	(0.0285)	(0.0474)	(0.0514)	(0.0533)	(0.0465)	(0.0461)	(0.0386)	(0.0359)	(0.0310)	(0.0253)
Trade	0.000779	-0.000748	-0.00148	0.00288	0.00178	0.00153	0.00102	-0.000145	0.000376	-0.0000425
	(0.00131)	(0.00218)	(0.00237)	(0.00246)	(0.00214)	(0.00212)	(0.00178)	(0.00165)	(0.00143)	(0.00116)
Constant	1.657***	0.992*	1.425**	1.466**	0.927*	1.352**	1.696***	2.378***	2.336***	2.442***
	(0.321)	(0.534)	(0.579)	(0.601)	(0.524)	(0.520)	(0.435)	(0.405)	(0.349)	(0.285)
Adjusted R^2	106	106	106	106	106	106	106	106	106	106
Fisher	0.263	--	--	--	--	--	--	--	--	--
Pseudo R^2	7.142***	--	--	--	--	--	--	--	--	--
Observations	--	0.230	0.282	0.312	0.382	0.393	0.461	0.463	0.469	0.431

	OLS	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90
					Panel C: School Enrolment - Primary and Facebook Penetration					
Media	0.0232***	0.0188**	0.0246**	0.0349***	0.0305***	0.0234***	0.0216***	0.0142**	0.0217***	0.0159***
	(0.00578)	(0.00906)	(0.0103)	(0.0103)	(0.0101)	(0.00889)	(0.00816)	(0.00663)	(0.00512)	(0.00472)
Primary	0.00686	-0.00396	0.00338	0.00841	0.0211**	0.0136	0.00888	0.00641	0.00649	0.00533
	(0.00568)	(0.00890)	(0.0101)	(0.0101)	(0.00992)	(0.00873)	(0.00802)	(0.00651)	(0.00503)	(0.00463)
Urban	-0.00299	-0.00795	-0.00749	-0.00641	-0.000869	-0.000751	0.00169	0.00406	-0.00341	0.00133
	(0.00480)	(0.00752)	(0.00857)	(0.00853)	(0.00838)	(0.00738)	(0.00678)	(0.00550)	(0.00425)	(0.00392)
GDP	-0.0267	0.00307	-0.0280	-0.0368	-0.0413	-0.0385	-0.0320	-0.0155	0.00704	0.00294
	(0.0244)	(0.0383)	(0.0436)	(0.0434)	(0.0427)	(0.0375)	(0.0345)	(0.0280)	(0.0216)	(0.0199)
Trade	0.000477	-0.00129	0.000154	0.000510	0.00163	0.00160	0.000782	0.0000453	0.000284	-0.000165
	(0.00126)	(0.00198)	(0.00226)	(0.00225)	(0.00221)	(0.00194)	(0.00178)	(0.00145)	(0.00112)	(0.00103)
Constant	1.115	1.594	0.982	0.518	-0.839	0.302	0.972	1.548**	1.939***	2.081***
	(0.675)	(1.058)	(1.206)	(1.200)	(1.179)	(1.037)	(0.953)	(0.774)	(0.597)	(0.551)
Adjusted R^2	0.245	--	--	--	--	--	--	--	--	--
Fisher	8.095***	--	--	--	--	--	--	--	--	--
Pseudo R^2	--	0.243	0.285	0.327	0.356	0.413	0.441	0.508	0.574	0.467
Observations	131	131	131	131	131	131	131	131	131	131

Abbreviation. Media – Facebook penetration; Tertiary – Tertiary school enrollment; Secondary – Secondary school enrollment; Primary – Primary school enrollment; Urban – Urbanization; Trade -Trade openness. OLS – Ordinary least square. Adjusted R^2 for OLS and Pseudo R^2 for quartile regression. For instance, Lower quantile (e.g., Q.10) signifies nations whose public accountability is least while Highest quantile (e.g., Q.90) reveals countries where public accountability is maximal

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 6: Education, social media and voice & accountability (Robustness Check)

	Dependent Variable: Voice & Accountability									
	OLS	**0.10**	**0.20**	**0.30**	**0.40**	**0.50**	**0.60**	**0.70**	**0.80**	**0.90**
	Panel A: School Enrolment - Tertiary and Facebook Penetration									
Media	0.0357***	0.0332***	0.0326***	0.0413***	0.0432***	0.0379***	0.0414***	0.0341***	0.0201***	0.0154***
	(0.00556)	(0.00870)	(0.00986)	(0.00969)	(0.00801)	(0.00654)	(0.00797)	(0.00857)	(0.00728)	(0.00557)
Tertiary	0.00910***	0.00876*	0.00929	0.00934	0.00827*	0.0125***	0.0104**	0.00841	0.00484	0.00756**
	(0.00337)	(0.00527)	(0.00598)	(0.00587)	(0.00485)	(0.00397)	(0.00483)	(0.00519)	(0.00441)	(0.00338)
Urban	-0.0131***	-0.0189**	-0.0137	-0.0177**	-0.0153**	-0.0171***	-0.0136*	-0.00530	0.00921	0.00633
	(0.00481)	(0.00753)	(0.00854)	(0.00839)	(0.00693)	(0.00567)	(0.00690)	(0.00742)	(0.00630)	(0.00483)
GDP	-0.0327	-0.0949***	-0.0544	-0.0347	-0.0215	-0.0115	-0.00344	-0.0109	-0.00648	-0.0194
	(0.0228)	(0.0356)	(0.0404)	(0.0397)	(0.0328)	(0.0268)	(0.0326)	(0.0351)	(0.0298)	(0.0228)
Trade	0.00143	-0.00116	0.00153	0.000329	0.000601	0.00206	0.00101	0.000996	0.00156	0.00169
	(0.00112)	(0.00175)	(0.00198)	(0.00195)	(0.00161)	(0.00131)	(0.00160)	(0.00172)	(0.00146)	(0.00112)
Constant	-0.424*	-0.556	-0.884**	-0.433	-0.516	-0.504*	-0.348	-0.485	-0.651**	-0.331
	(0.229)	(0.359)	(0.407)	(0.399)	(0.330)	(0.270)	(0.328)	(0.353)	(0.300)	(0.230)
Adjusted R^2	0.579	--	--	--	--	--	--	--	--	--
Fisher	28.34***	--	--	--	--	--	--	--	--	--
Pseudo R^2	--	0.294	0.346	0.403	0.522	0.652	0.525	0.456	0.469	0.459
Observations	109	109	109	109	109	109	109	109	109	109
	OLS	**0.10**	**0.20**	**0.30**	**0.40**	**0.50**	**0.60**	**0.70**	**0.80**	**0.90**
	Panel B: School Enrolment - Secondary and Facebook Penetration									
Media	0.0334***	0.0326***	0.0341***	0.0281***	0.0319***	0.0406***	0.0350***	0.0377***	0.0221***	0.0172***
	(0.00547)	(0.00796)	(0.00873)	(0.00867)	(0.00798)	(0.00704)	(0.00838)	(0.00677)	(0.00700)	(0.00544)
Secondary	0.0107***	0.00256	0.00862	0.0114**	0.0118**	0.00927**	0.0118**	0.0134***	0.00959**	0.00924***
	(0.00345)	(0.00502)	(0.00550)	(0.00546)	(0.00503)	(0.00444)	(0.00528)	(0.00427)	(0.00441)	(0.00343)
Urban	-0.0124**	-0.0124*	-0.0190**	-0.0127*	-0.0108	-0.00935	-0.00749	-0.0141**	-0.000388	0.00239
	(0.00475)	(0.00691)	(0.00758)	(0.00753)	(0.00693)	(0.00612)	(0.00728)	(0.00588)	(0.00608)	(0.00473)
GDP	-0.0430*	-0.107***	-0.104***	-0.0712*	-0.0726**	-0.0427	-0.0203	0.00872	-0.0128	-0.0374
	(0.0231)	(0.0336)	(0.0368)	(0.0366)	(0.0337)	(0.0297)	(0.0354)	(0.0286)	(0.0295)	(0.0230)
Trade	0.000705	-0.00118	0.000437	0.000603	-0.0000203	-0.000430	0.000596	0.00139	0.00123	0.000243
	(0.00106)	(0.00155)	(0.00170)	(0.00168)	(0.00155)	(0.00137)	(0.00163)	(0.00132)	(0.00136)	(0.00106)
Constant	-0.825***	-0.659*	-0.743*	-0.997**	-0.992**	-0.934***	-1.109***	-0.860***	-0.653*	-0.389
	(0.260)	(0.379)	(0.415)	(0.412)	(0.379)	(0.335)	(0.399)	(0.322)	(0.333)	(0.259)
Adjusted R^2	0.594	--	--	--	--	--	--	--	--	--
Fisher	29.22***	--	--	--	--	--	--	--	--	--
Pseudo R^2	--	0.324	0.394	0.455	0.528	0.610	0.503	0.582	0.492	0.474
Observations	106	106	106	106	106	106	106	106	106	106

	OLS	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90
					Panel C: School Enrolment - Primary and Facebook Penetration					
Media	0.0400***	0.0369***	0.0373***	0.0416***	0.0487***	0.0499***	0.0513***	0.0389***	0.0309***	0.0208***
	(0.00519)	(0.00874)	(0.00812)	(0.00809)	(0.00757)	(0.00719)	(0.00720)	(0.00688)	(0.00600)	(0.00621)
Primary	0.00423	0.00441	0.000712	0.00399	-0.000463	-0.00295	-0.00433	0.00352	0.000199	0.00181
	(0.00510)	(0.00859)	(0.00797)	(0.00795)	(0.00743)	(0.00706)	(0.00707)	(0.00675)	(0.00590)	(0.00610)
Urban	-0.00845*	-0.0146**	-0.0150**	-0.0123*	-0.0138**	-0.0107*	-0.0113*	-0.00272	0.00390	0.0110**
	(0.00431)	(0.00726)	(0.00674)	(0.00672)	(0.00628)	(0.00596)	(0.00597)	(0.00571)	(0.00498)	(0.00516)
GDP	-0.0403*	-0.0787**	-0.117***	-0.0800**	-0.0610*	-0.0290	-0.0127	-0.00379	-0.00983	-0.0135
	(0.0219)	(0.0369)	(0.0343)	(0.0342)	(0.0320)	(0.0304)	(0.0304)	(0.0290)	(0.0254)	(0.0262)
Trade	0.000628	-0.00174	0.000452	0.000380	0.000134	0.000670	0.000584	0.00226	0.00110	0.00124
	(0.00113)	(0.00191)	(0.00177)	(0.00177)	(0.00165)	(0.00157)	(0.00157)	(0.00150)	(0.00131)	(0.00136)
Constant	-0.813	-0.990	-0.487	-0.832	-0.263	-0.137	0.153	-0.849	-0.405	-0.563
	(0.606)	(1.020)	(0.948)	(0.945)	(0.883)	(0.839)	(0.840)	(0.803)	(0.701)	(0.725)
Adjusted R^2	0.501	--	--	--	--	--	--	--	--	--
Fisher	25.11***	--	--	--	--	--	--	--	--	--
Pseudo R^2	--	0.252	0.362	0.416	0.475	0.511	0.500	0.490	0.489	0.355
Observations	131	131	131	131	131	131	131	131	131	131

Abbreviation. Media – Facebook penetration; Tertiary – Tertiary school enrollment; Secondary – Secondary school enrollment; Primary – Primary school enrollment; Urban – Urbanization; Trade -Trade openness. OLS – Ordinary least square. Adjusted R^2 for OLS and Pseudo R^2 for quartile regression. For instance, Lower quantile (e.g., Q.10) signifies nations whose public accountability is least while Highest quantile (e.g., Q.90) reveals countries where public accountability is maximal

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Appendices

Appendix 1 – Definition of variables

Variables	Acronyms	Definitions	Sources
Accountability index	Index	"Government accountability is understood as constraints on the government's use of political power through requirements for justification for its actions and potential sanctions."	V-Dem
Vertical accountability index	Vertical	"Vertical accountability captures the extent to which citizens have the power to hold the government accountable."	V-Dem
Horizontal accountability index	Horizontal	"Horizontal accountability concerns the power of state institutions to oversee the government by demanding information, questioning officials and punishing improper behavior."	V-Dem
Diagonal accountability index	Diagonal	"Diagonal accountability covers the range of actions and mechanisms that citizens, civil society organizations CSOs, and an independent media can use to hold the government accountable."	V-Dem
Voice and Accountability	VA	"It 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"	WGI
Facebook penetration	Media	"Facebook penetration (2012), defined as the percentage of the total population that uses Facebook"	Quintly
Primary school enrollment	Primary	School enrollment, primary (% gross)	WDI
Secondary school enrollment	Secondary	School enrollment, secondary (% gross)	WDI
Tertiary school enrollment	Tertiary	School enrollment, tertiary (% gross)	WDI
Urbanization	Urban	Urban population (% of total population)	WDI
Gross Domestic Product	GDP	GDP growth (annual %)	WDI
Trade Openness	Trade	Export plus import (% of GDP)	WDI

V-Dem: Varieties of Democracy Database; WGI: World Governance Indicators of the World Bank; WDI: World Development Indicators of the World Bank.

Appendix 2 – Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Index	168	.774	.838	-1.948	2.059
Vertical	168	.744	.203	.067	.962
Diagonal	168	.748	.246	.039	.981
Horizontal	168	.651	.294	.014	.99
VA	168	-.143	.987	-2.25	1.728
Media	159	20.25	18.562	.038	97.637
Tertiary	116	38.735	27.575	1.335	113.741
Secondary	119	80.195	27.701	15.059	157.795
Primary	145	103.831	13.078	68.394	148.19
GDP	164	2.865	9.959	-8.553	121.78
Urban	167	57.802	22.502	11.194	100
Trade	158	94.283	58.593	24.721	430.569

Abbreviation. Media – Facebook penetration; Tertiary – Tertiary school enrollment; Secondary – Secondary school enrollment; Primary – Primary school enrollment; Urban – Urbanization; Trade -Trade openness.

Appendix 3 – Correlation matrix

	Index	Vertical	Diagonal	Horizontal	VA	Media	Tertiary	Secondary	Primary	Urban	Gdp	Trade
Index	1											
Vertical	0.940***	1										
Diagonal	0.942***	0.868***	1									
Horizontal	0.915***	0.844***	0.832***	1								
VA	0.943***	0.892***	0.840***	0.847***	1							
Media	0.629***	0.621***	0.489***	0.574***	0.743***	1						
Tertiary	0.535***	0.510***	0.394***	0.463***	0.602***	0.668***	1					
Secondary	0.500***	0.533***	0.327**	0.437***	0.620***	0.667***	0.773***	1				
Primary	-0.151	-0.237*	-0.193	-0.130	-0.104	-0.107	-0.112	-0.0229	1			
Urban	0.439***	0.447***	0.314**	0.352***	0.547***	0.767***	0.694***	0.700***	-0.112	1		
GDP	-0.460***	-0.378***	-0.434***	-0.405***	-0.472***	-0.491***	-0.502***	-0.412***	0.0866	-0.509***	1	
Trade	0.0819	0.148	0.0671	0.0600	0.245*	0.285**	0.0970	0.269*	-0.0912	0.339**	-0.161	1

*p< 0.05, **p< 0.01, ***p< 0.001. Abbreviation. Media – Facebook penetration; Tertiary – Tertiary school enrollment; Secondary – Secondary school enrollment; Primary – Primary school enrollment; Urban – Urbanization; Trade -Trade openness.

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