



Research Article

Corruption perception, institutional quality and performance of listed companies in Nigeria

Stephen Ojeka^a, Alex Adegboye^{a,*}, Kofo Adegboye^b, Olaoluwa Umukoro^a, Olajide Dahunsi^a, Emmanuel Ozordi^a

^a Department of Accounting, Covenant University, Ota, Ogun State, Nigeria

^b Department of Accounting, Obafemi Awolowo University, Ile-Ife, Osun State, Nigeria

ARTICLE INFO

Keywords:

Economics
Bribery
Corruption perception
Institutional environment
Firm performance
Nigeria

ABSTRACT

We examine the effect of corruption perception and institutional quality on the performance of firms based on the extracted data for 135 listed companies in Nigeria with timeframe 2013–2017. We first use the Transparency International Corruption Perception Index for the baseline analysis, which evaluates the public officials and politicians' corruption practices. To capture institutional quality, which depicts the level of law enforcement to curb corruptive practices of the public officials, we use the first component via Principle Component Analysis of six governance indicators extracted from World Bank Governance Indicators. We then use the Generalized Method of Moment (GMM) for the analysis. We find that corruption is negatively related to the market value (TobinQ) and accounting value performance (ROA). Similarly, institutional quality is negatively related to TobinQ and ROA. The results suggest that corruption and institutional quality weaken the market and accounting performance firms in Nigeria. We further compare the extent of corruption and institutional quality on performance between financial and non-financial institution. We find that both corruption and weak institutional environment tend to impair the market and accounting-based performance of non-financial firms, which could be traced to the less regulatory body in such institution compared to the financial institution. We suggest that Nigeria needs more effective and strong mechanisms proactive to curb corruption practices and weak institutional quality.

1. Introduction

Corruption is a serious global issue. Governments, policymakers, global institutions, and academics are fascinatingly concerned about the effect of corruption practices on economic development and enabling business environment (Awasthi and Bayraktar, 2015; Dutta and Sobel, 2016; IMF Working Paper, 2009; Xie et al., 2017). Notwithstanding, the concern for global growth has been a center of attraction in the modern era of economic architecture. The global vulnerability to corruption is imminent in the absence of stringent international legislation and regulations, which currently cost 5% of the global Gross Domestic Product (IMF, 2019). This has plagued employment, social infrastructure, poverty alleviation, foreign direct investment, human capital empowerment, economic reputation and social peaceful coexistence (Corrado and Rossetti, 2018). Behavioral dynamism of corruption perpetration is commonly attributable to a deliberately created loophole in economic policies and frameworks, which disdain opportunity for internal sustainable development (Canare, 2017). Thus, corruption instigates lack of

transparency and poor regulatory supervision in global governance where there is noticeable laxity of legal jurisprudence or adequate political will to control, protect and increase value within the chain of governance.

In Nigeria, corruption is highly accentuated by the aggressive perpetration especially among public officials and institutional environment. In 2018, Nigeria ranks 144 least corrupt nation out of 175 countries promulgated by Transparency International. The corruption perceptions index indicates the outrageous occurrences of an aggravated situation which looms largely on money laundering, bribery, tax evasion, forgery and perjury, aiding and abetting, ghost workers payroll, ghost contract award, nepotism, electoral malpractices, embezzlement and others. Corruption has been responsible for the political instability of successive government since the Nigerian First Republic of 1963. Every coup since the first republic has been in the name of fighting corruption. Although corruption is universally rooted, its impacts are more severe and profound in Nigeria (Lim, 2017). Similarly, listed corporations operating within the Nigerian business environment have been faced

* Corresponding author.

E-mail address: adegboyea1@gmail.com (A. Adegboye).

<https://doi.org/10.1016/j.heliyon.2019.e02569>

Received 26 June 2019; Received in revised form 3 August 2019; Accepted 30 September 2019

2405-8440/© 2019 The Author(s). Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

with dilemma of dwindling stock prices, low market capitalization margin, incessant poor trading result in the stock market, high-risk volatility and ill-returns thus, discourages massive foreign direct investment. For instance, corruption cases in Nigeria include the misappropriation of the whopping tune of \$16 billion under the Obasanjo led administration in Nigeria between 1999–2007, which was budgeted to revamp the deplorable state of the power sector. In Nigeria, electricity supply has been steadily unstable due to poor funding and interrupted value chain in power generation, transmission, distribution and consumption. This has led to high overhead cost to power heavy industrial machinery. The failure of entrepreneurship development in Nigeria is also motivated by this menace. This situation influences major hiccups to the attraction of local and foreign investors. Another scenario was the embezzlement of \$2 billion arms procurement scandal traced to the former national security adviser under the Goodluck Jonathan regime from 2010–2015. The sum was budgeted to procure ammunition, security and other surveillance intelligent equipment to fight the dreadful Boko Haram insurgency in Nigeria. Tactlessly, the rising threat of this Islamist terrorist attacks has cost the nation billions of naira lost to viable economic and commercial activities in the northern community. The former president of Nigeria Olusegun Obasanjo acclaims that “Nigeria's external image took a serious bashing, as our beloved country began to fixture on every corruption index”. While all successive governments have been conscious to unravel and mitigate corruption practices in the fabrics of the Nigerian economy, these efforts are yet to yield the desired results.

There remain two profound strands of literature on corruption globally, which emphasize the positivity and negativity outcomes of corruption. The first school of thought assesses corruption as an impediment to economic growth. The literature avers a strong and negative connection between corruption and economic growth (Pradhan et al., 2000; Treisman, 2003). This suggests that corruption could hamper probable foreign direct investment and increase the cost of obtaining a license or permit to operate from government officials. Thus, corruption harms economic growth by deterring innovation through entrepreneurship, resource idleness, impede tax revenues and obstruction of regulation formation and implementations. On the other hand, another strand of literature term corruption as “grease the wheel” supports the postulation that corruption tends to speed up the wheels of business, which in turn positively influence firm development by responding to the demand of the bureaucracy and surpass the timely processes (Wei, 1998). Similarly, Ades and Di Tella (1999) argue that higher corruption practices transpire in economies characterized with higher trade blockades, where domestic businesses are exposed to lesser global competition or where there is the existence of few dominant corporations.

Notably, little empirical studies have validated the influence of corruption perception on firm performance in the Nigerian context, which this study tends to explore. Nevertheless, two prior studies contribute immensely to corruption perception and performance literature in Nigerian context that is Ubi and Udah (2014) and Yaroson (2013). Ubi and Udah (2014) regard corruption as a dilemma, which has been on the increase in Nigeria owing to the complete absence of good governance in public sector practices. This further affirms that corruption as a social vice emanated from abuse of public offices within the prerogative power vested in the hands of those who supposedly should protect the rule of law. Thus, corruption has negatively influenced the Nigerian economic system thereby affecting the level of accountability, judicial quality, transparency and political values, institutional reforms and standard of living. Yaroson (2013) reveals the effect of corruption on financial sector performance in Nigeria. The study reiterates that the failure of banks recapitalization in 2004 leading to merger, outright acquisition and or liquidation of some affected much-anticipated growth in the country.

We examine the effect of corruption and institutional quality on the performance of firms based on the extracted data for 135 listed companies in Nigeria with timeframe 2013–2017. We first use the Transparency International Corruption Perception Index for the main analysis,

which estimates the countries-times variations. The Index evaluates the public officials and politician corruption perception. We further use the Corruption Index developed by World Bank proxied for corruption perception in the robustness analysis. We infer that the corruption perception retrogressively influences both the market value and accounting value performance of the listed firms. We further compare the extent of corruption perception on performance between financial and non-financial institution. We find that corruption perception tends to prejudice the market and accounting-based performance of non-financial firms, which could be traced to the less regulatory body in such institution compared to the financial institution.

To capture institutional environment, which tends to depict the level of law enforcement to curb inefficient performances of the public officials, we use the measure based on the first component of six governance indices developed by World Bank Governance Indicators. The measures for the institutional governance indicators range from -2.5 to 2.5 with a lower value indicating severe problems. We then rescale and reverse the measures range from 0 to 10 with higher value depicting severe problems for robustness analysis. Our finding shows that institutional quality is negatively related to market-based and accounting-based performance measures. This suggests that weak institutional quality decreases the market and accounting performance firms in Nigeria. Besides, we find that the governance indicators of political instability and violence, government effectiveness, rule of law, voice and accountability except for regulatory quality, other institutional environment indices are positively related to both market and accounting-based performance. We further compare the extent of institutional quality on performance between financial and non-financial institution. We find that the weak institutional environment tends to impair the market and accounting-based performance of non-financial firms, which could be traced to the less regulatory body in such institution compared to the financial institution.

This study expands the existing literature and makes profound contributions. First, we examine the strong connection between corruption perception and firm performance in the Nigerian context where we identify the industry most affected by the plague. In this study, we argue against the positivist opinion because corruption is dynamic to Nigerian environment in a way that its influence is retrogressive on the performance of corporations. Also, there exists no empirical finding that has evaluated the significant policy consideration for corruption perception and firm performance in the Nigerian context. However, this study has policy implications for regulators and stakeholders. We further establish that corruption perception does not mainly hamper the performance of corporation but also institutional environment, especially for non-financial institutions.

The paper proceeds in the following patterns: Section 2 undertakes the research design and methodology. Section 3 presents descriptive statistics, empirical analysis results and the robustness analysis. Section 4 makes conclusions and policy implication.

2. Methodology

2.1. Sample

The study draws a set of firm-level and economic data from a sample of 810 firm-year observations for 135 listed companies on Nigerian Stock Exchange with a total number of 169 listed companies as at May 31, 2018. The data ranges from the period of 2012–2017 after following some filtering conditions. In addition, this study fails to explore the entire listed companies in Nigeria because some companies are newly listed in which their data is not readily available. To sort the adopted data and derive the final sample for the analysis, we first eliminate firms with unavailable variables desired for the study. In addition, firms with a minimum of five years consecutive data are selected, which allow for the robustness of results (Petersen, 2009). Table 1 shows a summary of the sample selected.

Table 1
Summary of the sample selected.

Sector	Population	Sample selected
Agriculture	5	5
Conglomerate	6	5
Construction Estate	9	3
Consumer Goods	21	18
Financial Services	55	48
Healthcare	10	7
Information Technology	9	5
Industrial Goods	13	12
Natural Resources	4	3
Oil and Gas	12	10
Services	25	19
Total	169	135

2.2. Measures

Table 2 provides the definitions of the adopted variable for this study. All firm-level variables are hand-collected from the firms' financial statement and share prices of each firm are derived from the Nigerian Stock Exchange website. While corruption perception and institutional quality indices are collected from the Transparency International Database and World Development Indicators respectively, the economy level variables are derived from the World Bank Database.

2.2.1. Firm performance

To examine the influence of corruption on firm performance, we use the accounting measure that is the book value of return on assets (ROA) and Tobin Q proxied for the market-based measure. The Return on Asset designates the periodic earnings of the firm in relation to its total assets used for the generation of operating cash flow while TobinQ indicates the

firm market performance, which could be more steady measure for firm performance than Return on Asset (Adams and Veprauskait, 2013). The adopted measures of the firm performance provide a concrete fundamental for assessing the influence of corruption and institutional quality on the performance of corporations. These measures are consistent with prior studies (Bennouri et al., 2018; Huang and Kang, 2017; Pantea et al., 2014; Raithatha and Komera, 2016; Ringov, 2017; Samson, 2015; Zagorchev and Gao, 2015)

2.2.2. Corruption perception

To explore the corruption perception, we use the Transparency International Corruption Perception Index for the main analysis, which estimates the countries-times variations. The Index evaluates the public officials and politician corruption perception. Recently, Transparency International has rescaled the Index ranging 0–100 with lower value depicting higher corruption. For consistency with the study model, we reverse the Index with a higher value indicating sophisticated corruption. We further use the Corruption Index developed by World Bank proxied for corruption perception in the robustness analysis. The World Bank Control of Corruption Index, which ranges between -2.5 to 2.5 with a lower value reflecting higher corruption. To avoid inconsistency with the statistical model, we rescale the Index and re-gear the index ranging 0–10 with the lower value indicating minimized corruption and vice-versa. Prior studies have adopted the measures to proxy for corruption perception (Canare, 2017; Gaviria, 2001; Kim et al., 2018; Ozili, 2019; Thakur and Kannadhasan, 2019).

2.2.3. Institutional quality

Institutional environment matters in the determination of firm performance in a given country. It is assumed that countries characterized with the weak legal system and poor governance might have weaker

Table 2
Definition of variables.

Variables	Acronymy	Measurement	Source
Firm Performance			
Tobin Q	Tobin	Tobin's Q is calculated as the book value of total assets minus the book value of equity plus the market value of equity, all divided by the book value of total assets.	Bloomberg & Annual Report
Return on Asset	ROA	Return on Asset for sampled firms: Profit after Taxation divided by Total Asset of the firm	Annual Report
Corruption Perception			
Corruption Perception Index	CPI	Corruption Perception Index: Reversed measure ranging from 0-100 with higher values depicting higher corruption.	Transparency International
Control of Corruption Index	CCI	Control of Corruption Index ranging from -2.5 to 2.5. For robustness, the index is reversed ranging 0–10 with higher values depicting higher corruption	World Bank
Institutional Quality			
Political Instability and Violence	Pol	Measure based on the first component of six governance indicators CCI, Pol, Govt, RQ, RL and VAC via Principal Component Analysis. Political Instability and Violence Index ranging from -2.5 to 2.5. For Robustness, we reverse the index ranging 0–10 with higher value depicting severe problematic.	World Bank
Government Effectiveness	Govt	Government Effectiveness Index ranging from -2.5 to 2.5. For Robustness, we reverse the index ranging 0–10 with higher value depicting severe delinquent.	World Bank
Regulatory Quality	RQ	Rule Quality Index ranging from -2.5 to 2.5. For Robustness, we reverse the index ranging 0–10 with higher value depicting severe problematic.	World Bank
Rule of Law	RL	Rule of Law Index ranging from -2.5 to 2.5. For Robustness, we reverse the index ranging 0–10 with higher value depicting severe delinquent.	World Bank
Voice and Accountability	VAC	Voice and Accountability Index ranging from -2.5 to 2.5. For Robustness, we reverse the index ranging 0–10 with higher value depicting severe problematic	World Bank
Firm-Level Variables			
Market Leverage	Lev	Total Debt/(Total Common Equity + Total Debt)	Annual Report
Firm Age	Inage	Natural Logarithm of Year under observation less Year of Listing on Nigerian Stock Market	Annual Report
Firm Size	Inasset	Natural Logarithm of Total Asset	Annual Report
Tangibility	TAN	The ratio of Fixed Assets to Total Assets	Annual Report
Country Level Variables			
Inflation	Inf	Inflation, Consumer Price Index (annual %)	World Bank
Domestic Credit	DC	Domestic Credit to Private Sector by banks (% of GDP)	World Bank
Foreign Direct Investment	FDI	Natural logarithm of Foreign Direct Investment, net (BoP, current US\$)	World Bank

Table 3
Descriptive statistics.

VARIABLES	N	Mean	S. D	Min.	Max.
Firm Performance					
TobinQ	810	1.428	1.611	-13.52	13.94
ROA	810	0.0245	0.404	-4.991	9.269
Corruption Perception					
CPI	810	73.33	0.943	72	75
CCI	810	-1.140	0.0865	-1.270	-1.030
Institutional Quality					
Pol	810	-2.002	0.0909	-2.130	-1.880
Govt	810	-1.032	0.0832	-1.190	-0.960
RQ	810	-0.808	0.0938	-0.920	-0.660
RL	810	-1.027	0.0929	-1.150	-0.870
VAC	810	-0.500	0.165	-0.700	-0.310
Firm Level					
LEV	810	0.212	0.901	-20.74	6.089
TAN	810	0.353	0.531	-0.0687	7.959
lnasset	810	16.69	2.142	11.59	22.45
lnage	790	2.752	0.859	0	7.607
Country Level					
Inf	810	11.66	3.423	8.062	16.52
DC	810	13.82	1.263	11.83	15.66
FDI	810	21.06	0.0984	20.93	21.19

Note: Tobin is Tobin Q, ROA is Return on Asset, CPI is Corruption Perception Index, CCI is the Control of Corruption Index, Quality is Institutional Quality, Pol is Political Instability and Violence, Govt is Government Effectiveness, RQ is Regulatory Quality, RL is Rule of Law, VAC is Voice and Accountability, Lev is Market Leverage, lnage is Firm Age, lnasset is Firm Size, TAN is Tangibility, Inf is Inflation, DC is Domestic Credit to Private Sector by banks, and FDI is Foreign Direct Investment.

firms as a result of inept law enforcement and government ineptitude (Barth et al., 2004; Klomp and Haan, 2015). To capture institutional quality, which tends to depict the level of law enforcement to curb corruptive performances of the public officials, we use the measure based on the first component of six governance indices, which include Control of Corruption, Political instability and violence, Government effectiveness, Regulatory Quality, Rule of Law and Voice and Accountability via Principal Component Analysis. The measures for the governance indicators range from -2.5 to 2.5 with a lower value indicating severe problems. In the robustness analysis, we rescale and reverse the measures range from 0 to 10 with higher value depicting severe problems consistent with the study of Thakur and Kannadhasan (2019).

2.2.4. Control variables

To explore the influence of corruption perception on firm performance, we draw the firm-level control variable from prior studies on the determinants of firm performance (Florio and Leoni, 2016; Gaviria, 2001; Mertzianisa et al., 2019; Nyberg et al., 2010; Quon et al., 2012). The control variable encompasses the firm size, the firm age, market leverage and tangibility of the firm. We use log of assets proxied for firm size to control its influence on the firm performance. To control for the firm development phase, we use the natural logarithm of the firm age. We control for the firm capital concentration proxied with the ratio of the

firm physical assets to total assets. We include the firm leverage as it influences the tax advantages and risk of bankruptcy. Furthermore, we control for the country level, which indicates the influence of economic factors on the performance of corporations at the national level. The control variables include inflation, Domestic Credit to Private Sector by banks and Foreign Direct Investment, which capture unobservable influences and identification of any spurious relations. The inflation rate indicates the macroeconomic instability in the country level. We include Domestic Credit to the Private Sector by banks (% of Gross Domestic Product) measures the level of fund availability provided by the financial intermediaries. In addition, we include Foreign Direct Investment to capture the level of friendliness of the country to foreign investors.

2.3. Model

We estimate the influence of corruption perception and institutional quality on the performance of Nigerian firms via a dynamic panel data estimator. To achieve this objective, we specify the following dynamic model.

$$Perf_{i,t} = \beta_0 + \beta_1 Perf_{i,t-1} + \beta_2 Perception_{i,t} + \sum_{j=1}^j a_j X_{jit} + \varepsilon_{it} \quad (1)$$

Where $Perf_{i,t}$ represents the performance of firm i in time t proxied by the TobinQ and Return on Asset, $Perf_{i,t-1}$ is the one year lagged of firm performance, which captures the dependent variable persistence. This signifies the estimate for a linear dynamic panel data model. In addition, $Perception$ measures the extent of corruption perception and institutional quality for country i in time t . X_{jit} measures the firm level and country-level control variable and ε_{it} is the error term. Furthermore, our interested coefficient is β_2 which captures the impact of the effect of corruption perception and institutional environment on the firm performance in Nigeria.

It is assumed that if the fixed effect or random effect is applied to dynamic panel data, the unobserved individual effect could correlate with both the endogenous regressors and predetermined regressors. Thus, Arellano and Bond (1991) developed the Difference Generalized Method of Moment estimator to eliminate the unobserved individual effect and its associated variable bias by the first differentiation equation. Although dynamic panel estimators allow for dynamic economic activities, it also controls for unobserved heterogeneity. We use the One-Step Difference Generalized Method of Moment estimator for the study empirical analysis. Another prominent aspect of the Difference GMM estimator relays to the choice of instruments used in the model adopted. The instrument used becomes inevitable holding to the likely potential correlation between the lagged dependent variable and other disturbance terms. Nonetheless, the process of differencing the initial dynamic panel data model disregards endogeneity, in which only interrelated individual effects are eliminated. Potential endogeneity bias is evident once the model is first differenced. Under this study, there is no lag interval specified for the choice of instruments used.

Moreover, Arellano and Bond (1991) suggest a test for the hypothesis

Table 4
Correlation matrix.

	CPI	CCI	Pol	Govt	RQ	RL	VAC	Quality
CPI	1							
CCI	-0.430***	1						
Pol	-0.441***	0.996***	1					
Govt	0.454***	0.445***	0.395***	1				
RQ	0.692***	-0.696***	-0.724***	0.189***	1			
RL	-0.203***	0.604***	0.600***	0.258***	-0.776***	1		
VAC	-0.472***	0.852***	0.872***	0.118***	-0.934***	0.846***	1	
Quality	-0.431***	1.000***	0.998***	0.436***	-0.701***	0.602***	0.856***	1

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Note: CPI is Corruption Perception Index, CCI is the Control of Corruption Index, Quality is Institutional Quality, Pol is Political Instability and Violence, Govt is Government Effectiveness, RQ is Regulatory Quality, RL is Rule of Law, VAC is Voice and Accountability.

Table 5
Corruption perception, firm-economic characteristics and firm performance.

VARIABLES	TobinQ			Return on Asset		
	1	2	3	4	5	6
L.Tobin	0.402** (0.193)	0.440** (0.191)	0.435** (0.191)			
L.ROA				-0.0868 (0.154)	-0.0774 (0.131)	-0.0865 (0.151)
CPI		-0.213* (0.112)	-0.335** (0.133)		-0.0811** (0.0351)	-0.0492*** (0.0183)
lnasset	-0.546 (0.355)	-0.569* (0.343)	-0.518 (0.356)	0.00181 (0.00924)	0.00512 (0.0106)	0.00190 (0.00920)
lnage	0.505 (0.332)	0.438* (0.245)	0.706** (0.332)	0.0304 (0.0224)	0.0366 (0.0253)	0.0312 (0.0225)
TAN	-0.723*** (0.132)	-0.744*** (0.132)	-0.716*** (0.138)	-0.0452** (0.0225)	-0.0397* (0.0235)	-0.0446** (0.0223)
Inf	-0.0440 (0.0387)	-0.0348** (0.0170)	-0.0822* (0.0455)	0.0155 (0.0153)	-0.00322 (0.00517)	0.00943 (0.0152)
DC	0.0142 (0.0772)	-0.189* (0.109)	-0.198* (0.108)	-0.0557 (0.0411)	-0.0922* (0.0479)	-0.0900** (0.0446)
LEV	0.0442 (0.0694)		0.0396 (0.0733)	0.0765 (0.0869)		0.0763 (0.0869)
FDI	-0.595 (0.894)		-1.318 (0.993)	0.454 (0.366)		0.343 (0.371)
Observations	528	528	528	528	528	528
Hansen_test	10.06	9.445	10.28	25.34	27.62	29.95
Hansen Prob	0.345	0.581	0.328	0.208	0.0102	0.480
AR (1) test	-1.939	-2.087	-2.100	-2.932	-2.876	-2.883
AR (1) P-value	0.0524	0.0369	0.0357	0.00336	0.403	0.00394
AR (2) test	-0.331	-0.452	-0.452	-0.709	-0.743	-0.692
AR (2) P-value	0.741	0.651	0.651	0.478	0.457	0.489

Robust standard errors in parentheses ***p < 0.01, **p < 0.05, *p < 0.1. Note: Tobin is Tobin Q, ROA is Return on Asset, CPI is Corruption Perception Index, CCI is the Control of Corruption Index, Quality is Institutional Quality, Pol is Political Instability and Violence, Govt is Government Effectiveness, RQ is Regulatory Quality, RL is Rule of Law, VAC is Voice and Accountability, Lev is Market Leverage, lnage is Firm Age, lnasset is Firm Size, TAN is Tangibility, Inf is Inflation, DC is Domestic Credit to Private Sector by banks, and FDI is Foreign Direct Investment.

that there exists no second-order serial correlation for the unobserved disturbance of the differenced equation. This becomes inevitable as the consistency of GMM estimator relies on the hypothesis. Two autocorrelation tests, among other diagnostics, are expected to confirm the applicability of the Difference GMM estimator namely: First Order [AR (1)] and Second-Order [AR (2)] autocorrelation tests. Thus, for the Arellano-Bond GMM estimator to be valid, we expect to reject the null hypothesis for the [AR (1)] test while we expect no to reject the null hypothesis for [AR (2)]. To determine the validity of instruments used, the Sargan's test and Hansen's test of over-identifying restrictions have been suggested. However, Roodman (2006) suggest the choice of relying on Hansen's J or Sargan's test depends on the presence of heteroscedasticity or non-sphericity in the errors. We expect not to reject the null hypothesis for both the Sargan's and Hansen's J test. However, in the presence of homoscedasticity, the Sargan's statistics are assumed to be a special case of Hansen's J, which makes the Sargan test statistic inconsistent for robust GMM.

3. Results & discussion

3.1. Descriptive statistics

Table 3 reports the summary statistics. The book value (Return on Asset) and market value (TobinQ) proxied for performance considerably vary in absolute terms. For market value performance, TobinQ has a mean of 1.428 whilst the Return on Asset for book value performance has 0.0245. However, TobinQ has higher dispersion than Return on Asset. From the table, it is perceived that corruption perception is more corruption with the higher mean value of 73.33. The institutional quality is perceived to be weak as all indicators show ranges between -0.6 to -2.13.

To eliminate any multicollinearity statistical problem in the study model, we first use the corruption index (CPI & CCI) in different regression specifications. We then use principal component analysis to

condense the governance indicators (Control of Corruption, Political instability and violence, Government effectiveness, Regulatory Quality, Rule of Law and Voice and Accountability) into an index. For robustness test, we also use the governance indicators in different regression specifications, which tends to eliminate multicollinearity problem identified in Table 4.

3.2. Empirical results

This section reports the estimation results of the influence of corruption and institutional environment on the performance of Nigerian firms using dynamic panel data estimator. Similarly, the validation of instrument is essential for consistency of GMM estimator. We address this issue by evaluating two specification tests. First, the Hansen test of over-identifying restrictions, which evaluates the overall validity of the instrument by examining the sample equivalent of the moment conditions in the adopted estimate. Second, testing the hypothesis that the error term is not serially correlated. Following the assumptions underpinning the selection of the instruments, all the study model specifications validate that no evidence of model misspecification following the Hansen test. The second test validates that AR [1] serial correlation test has first-order autocorrelation of residuals and there is no second-order autocorrelation of the residuals AR [2].

3.2.1. Corruption and performance

Table 5 shows the regression results of the firm level, economic level, corruption perception and firm performance. The model 1–3 of Table 5 includes the firm and economic characteristics on market value (TobinQ) and accounting value (Return on Asset) for model 4–6. Other specifications include the Corruption Perception Index by Transparency International (CPI) while adding the firm-level variable i.e. firm size (lnasset), firm age (lnage), tangibility (TAN), market leverage (LEV) and economic level variables i.e. inflation (Inf), Domestic Credit to Private Sector by

Table 6

Panel regression: Control of corruption index and performance.

VARIABLES	TobinQ		Return on Asset	
	1	2	3	4
L.Tobin	0.391* (0.203)	0.435** (0.191)		
L.ROA			-0.0776 (0.132)	-0.0865 (0.151)
CCI	-1.280** (0.519)	-1.467** (0.583)	-0.341*** (0.132)	-0.215*** (0.0802)
lnasset	-0.557* (0.333)	-0.518 (0.356)	0.00517 (0.0106)	0.00190 (0.00920)
lnage	0.595* (0.312)	0.706** (0.332)	0.0369 (0.0254)	0.0312 (0.0225)
TAN	-0.728*** (0.124)	-0.716*** (0.138)	-0.0395* (0.0234)	-0.0446** (0.0223)
Inf	-0.0124 (0.0174)	-0.0294 (0.0350)	0.00760 (0.00805)	0.0172 (0.0152)
DC	-0.00348 (0.0587)	0.0919 (0.0841)	-0.0168 (0.0216)	-0.0475 (0.0409)
LEV		0.0396 (0.0733)		0.0763 (0.0869)
FDI		-1.059 (0.940)		0.381 (0.369)
Observations	528	528	662	662
Hansen_test	9.521	10.28	26.45	29.95
Hansen Prob	0.391	0.328	0.148	0.480
AR (1) test	-1.848	-2.100	-2.882	-2.883
AR (1) P-value	0.0646	0.0357	0.00395	0.00394
AR (2) test	-0.578	-0.452	-0.741	-0.692
AR (2) P-value	0.563	0.651	0.459	0.489

Robust standard errors in parentheses ***p < 0.01, **p < 0.05, *p < 0.1. Note: Tobin is Tobin Q, ROA is Return on Asset, CPI is Corruption Perception Index, CCI is the Control of Corruption Index, Quality is Institutional Quality, Pol is Political Instability and Violence, Govt is Government Effectiveness, RQ is Regulatory Quality, RL is Rule of Law, VAC is Voice and Accountability, Lev is Market Leverage, lnage is Firm Age, lnasset is Firm Size, TAN is Tangibility, Inf is Inflation, DC is Domestic Credit to Private Sector by banks, and FDI is Foreign Direct Investment.

banks (% of GDP) (DC) and Natural logarithm of Foreign Direct Investment, net (BoP, current US\$).

However, we are mainly interested in corruption perception (CPI) and firm performance. The proxy CPI is negatively related to the market value and accounting value performance in all the model specifications. This result infers that the corruption perception retrogressively impairs both the market value and accounting value performance of the listed firms. The literature on rent-seeking assumes that firm participation in corrupt activities with public officials could be beneficial. In addition, the profit-maximizing firm is expected to maximize its earnings through an optimal amount of corruption, which could contextually influence performance positively. However, this study affirms that country-level corruption perception could harm the performance of firms. The negative relationship could be traced to the firm limitation to penetrate the available global markets (North, 1990). Thus, firm engagement in corruption practices such as payments and fees to corrupt public officials could curtail firm productivity. This is consistent with Dutta and Sobel (2016); Hallward-driemeier, Wallsten and Xu (2006). This result could be attributable to the higher corruption perception of developing countries compared to developed countries. Overall, the result attests that corruption practices could be detrimental to the firm's performance in developing countries while intending to profit from such practices. Therefore, our result fails to support the "grease the wheels" claims of corruption and performance of firms. This implies that the increase in corruption practices reduces the accounting value and market value performance of firms. That is, corruption perception hampers business performance. The proponent implication of this result suggests that eradicating corruption level is never detrimentally influence performance contrary to the "grease the wheels" hypothesis.

Table 7

Institutional quality and firm performance.

VARIABLES	TobinQ		Return on Asset	
	1	2	3	4
L.Tobin	0.435** (0.191)	0.391* (0.203)		
L.ROA			-0.0865 (0.151)	-0.0776 (0.132)
Quality	-0.0992** (0.0394)	-0.0861** (0.0350)	-0.0145*** (0.00542)	-0.0231*** (0.00896)
lnasset	-0.518 (0.356)	-0.557* (0.333)	0.00190 (0.00920)	0.00517 (0.0106)
lnage	0.706** (0.332)	0.593* (0.311)	0.0312 (0.0225)	0.0369 (0.0254)
TAN	-0.716*** (0.138)	-0.728*** (0.124)	-0.0446** (0.0223)	-0.0395* (0.0234)
Inf	-0.0305 (0.0352)	-0.0132 (0.0174)	0.0170 (0.0152)	0.00742 (0.00800)
DC	0.0948 (0.0846)	-0.00167 (0.0586)	-0.0471 (0.0409)	-0.0163 (0.0215)
LEV	0.0396 (0.0733)		0.0763 (0.0869)	
FDI	-1.068 (0.941)		0.379 (0.369)	
Observations	662	662	662	662
Hansen_test	10.28	9.514	29.95	26.49
Hansen Prob	0.328	0.391	0.480	0.146
AR (1) test	-2.100	-1.848	-2.883	-2.882
AR (1) P-value	0.0357	0.0646	0.00394	0.00395
AR (2) test	-0.452	-0.577	-0.692	-0.741
AR (2) P-value	0.651	0.564	0.489	0.459

Robust standard errors in parentheses ***p < 0.01, **p < 0.05, *p < 0.1. Note: Tobin is Tobin Q, ROA is Return on Asset, CPI is Corruption Perception Index, CCI is the Control of Corruption Index, Quality is Institutional Quality, Pol is Political Instability and Violence, Govt is Government Effectiveness, RQ is Regulatory Quality, RL is Rule of Law, VAC is Voice and Accountability, Lev is Market Leverage, lnage is Firm Age, lnasset is Firm Size, TAN is Tangibility, Inf is Inflation, DC is Domestic Credit to Private Sector by banks, and FDI is Foreign Direct Investment.

In addition, we check the results robustness with the inclusion of additional controls. Prior studies have identified the importance and strong connections of firm-level and country-level on firm performance (Cucculelli and Bettinelli, 2016; Pantea et al., 2014; Quon et al., 2012; Sumedrea, 2013). Thus, we include firm-level measures such as the firm size, age, capital expenditure and market leverage. We find that all firm-level measures except firm age are negatively and significantly related to market value. Firm size is a negative and significant predictor of Tobin Q. This result is consistent with Mertzanisa et al. (2019), which reveals a negative relationship between the firms' size measured by natural logarithm and performance measured by Tobin Q. The firm age is positive and significant, which implies that older firms tend to have higher market value. Firm tangibility is also a significant predictor of Tobin Q with a negative sign. On the other hand, only firm tangibility is negatively related to the accounting value (Return on Asset), which implies an adverse influence on ROA.

Other country-level variables such as inflation, Domestic Credit to Private Sector by banks and foreign direct investment. For market value, all variables are significant and negative in all model specifications except Domestic Credit to the Private Sector by banks. The economic inflation is negatively related to the Tobin Q. This result is consistent with Mertzanisa et al. (2019), which reveals that economic inflation inversely reduces the market value while its influence on accounting performance remains insignificant. In addition, the access to credit provided is never accelerated performance, which is evident in all our specifications. Furthermore, foreign direct investment has no significant influence on firm performance, which indicates that foreign direct investment is not necessarily a significant predictor for market and accounting performance.

Table 8
Institutional environment and market value.

VARIABLES	TobinQ				
	1	2	3	4	5
L.Tobin	0.628*** (0.134)	0.628*** (0.134)	0.628*** (0.134)	0.628*** (0.134)	0.628*** (0.134)
Pol	0.570** (0.262)				
Govt		0.534** (0.245)			
RQ			-1.694** (0.778)		
RL				0.924** (0.424)	
VAC					0.440** (0.202)
Inasset	-0.0369 (0.0292)	-0.0369 (0.0292)	-0.0369 (0.0292)	-0.0369 (0.0292)	-0.0369 (0.0292)
Inage	0.0285 (0.0788)	0.0285 (0.0788)	0.0285 (0.0788)	0.0285 (0.0788)	0.0285 (0.0788)
TAN	-0.304*** (0.110)	-0.304*** (0.110)	-0.304*** (0.110)	-0.304*** (0.110)	-0.304*** (0.110)
LEV	-0.0413 (0.0434)	-0.0413 (0.0434)	-0.0413 (0.0434)	-0.0413 (0.0434)	-0.0413 (0.0434)
FDI	-0.882 (0.781)	-0.517 (0.767)	1.188 (1.110)	1.369 (1.172)	-0.169 (0.788)
Inf	-0.0165 (0.0257)	-0.00906 (0.0262)	0.0409 (0.0384)	0.0470 (0.0405)	0.00137 (0.0276)
DC	0.0901 (0.0788)	-0.0473 (0.0836)	0.124 (0.0849)	-0.127 (0.105)	0.0649 (0.0758)
Observations	662	662	662	662	662
Hansen_test	12.82	12.82	12.82	12.82	12.82
Hansen Prob	0.462	0.462	0.462	0.462	0.462
AR (1) test	-2.529	-2.529	-2.529	-2.529	-2.529
AR (1) P-value	0.0114	0.0114	0.0114	0.0114	0.0114
AR (2) test	-0.397	-0.397	-0.397	-0.397	-0.397
AR (2) P-value	0.692	0.692	0.692	0.692	0.692

Robust standard errors in parentheses ***p < 0.01, **p < 0.05, *p < 0.1. Note: Tobin is Tobin Q, ROA is Return on Asset, CPI is Corruption Perception Index, CCI is the Control of Corruption Index, Quality is Institutional Quality, Pol is Political Instability and Violence, Govt is Government Effectiveness, RQ is Regulatory Quality, RL is Rule of Law, VAC is Voice and Accountability, Lev is Market Leverage, Inage is Firm Age, Inasset is Firm Size, TAN is Tangibility, Inf is Inflation, DC is Domestic Credit to Private Sector by banks, and FDI is Foreign Direct Investment.

For robustness analysis, we further perform another regression analysis using the World Bank Control of Corruption to checkmate the consistency of our findings. First, the World Bank Control of Corruption Index, which ranges between -2.5 to 2.5 with a lower value reflecting higher corruption. To avoid inconsistency with the statistical model, we rescale the Index and re-gear the index ranging 0–10 with the lower value indicating minimized corruption and vice-versa. The results are reported in Table 6. Overall, the results conform with regards to the corruption perception index (CPI) of Transparency International. The corruption measure is negatively and significant with market and accounting performance. This implies that the effect of corruption on performance in Nigeria is detrimental to the firm-level performance, which is contrary to the literature on rent-seeking hypothesis. By the upward corruption perception in Nigeria, a firm that tends to take advantage of corruption practices could impair the performance of such a firm. The result contravenes the "grease the wheel" perspective affirming that firms could benefit more in a corrupt environment by getting special treatment through various channels (Brada et al., 2019; Dincer and Fredriksson, 2013; Dutta and Sobel, 2016; Thakur and Kannadhasan, 2019; Xu and Li, 2018).

3.2.2. Institutional environment and performance

Institutional quality could influence the internal and external performance of firms. Therefore, it is necessary to explore whether a strong regulatory environment stimulates the performance of firms. It is then

Table 9
Institutional environment and accounting value.

VARIABLES	Return on Assets				
	1	2	3	4	5
L.ROA	-0.0865 (0.151)	-0.0865 (0.151)	-0.0865 (0.151)	-0.0865 (0.151)	-0.0865 (0.151)
Pol	0.100*** (0.0374)				
Govt		0.0938*** (0.0350)			
RQ			-0.298*** (0.111)		
RL				0.162*** (0.0605)	
VAC					0.0773*** (0.0288)
Inasset	0.00190 (0.00920)	0.00190 (0.00920)	0.00190 (0.00920)	0.00190 (0.00920)	0.00190 (0.00920)
Inage	0.0312 (0.0225)	0.0312 (0.0225)	0.0312 (0.0225)	0.0312 (0.0225)	0.0312 (0.0225)
TAN	-0.0446** (0.0223)	-0.0446** (0.0223)	-0.0446** (0.0223)	-0.0446** (0.0223)	-0.0446** (0.0223)
LEV	0.0763 (0.0869)	0.0763 (0.0869)	0.0763 (0.0869)	0.0763 (0.0869)	0.0763 (0.0869)
FDI	0.376 (0.369)	0.440 (0.366)	0.740** (0.372)	0.772** (0.374)	0.501 (0.364)
Inf	0.0165 (0.0152)	0.0179 (0.0153)	0.0266* (0.0160)	0.0277* (0.0161)	0.0197 (0.0154)
DC	-0.0456 (0.0408)	-0.0697* (0.0421)	-0.0397 (0.0408)	-0.0837* (0.0437)	-0.0500 (0.0409)
Observations	662	662	662	662	662
Hansen_test	29.95	29.95	29.95	29.95	29.95
Hansen Prob	0.480	0.480	0.480	0.480	0.480
AR (1) test	-2.883	-2.883	-2.883	-2.883	-2.883
AR (1) P-value	0.00394	0.00394	0.00394	0.00394	0.00394
AR (2) test	-0.692	-0.692	-0.692	-0.692	-0.692
AR (2) P-value	0.489	0.489	0.489	0.489	0.489

Robust standard errors in parentheses ***p < 0.01, **p < 0.05, *p < 0.1. Note: Tobin is Tobin Q, ROA is Return on Asset, CPI is Corruption Perception Index, CCI is the Control of Corruption Index, Quality is Institutional Quality, Pol is Political Instability and Violence, Govt is Government Effectiveness, RQ is Regulatory Quality, RL is Rule of Law, VAC is Voice and Accountability, Lev is Market Leverage, Inage is Firm Age, Inasset is Firm Size, TAN is Tangibility, Inf is Inflation, DC is Domestic Credit to Private Sector by banks, and FDI is Foreign Direct Investment.

expected that weak regulatory environment could lead to deteriorated enabling business environment, which in turns reflect on firm performance negatively. Table 7 shows the effect of institutional quality on the performance of firms in Nigeria. We capture institutional quality based on the first component of six governance indices by condensing the indicators such as Control of Corruption, Political instability and violence, Government effectiveness, Regulatory Quality, Rule of Law and Voice and Accountability via Principal Component Analysis. This depicts the level of law enforcement to curb corruptive performances of the public officials. Thus, we first include the aggregated measure of the institutional environment indicators, which is the standardized six measures representing the institutional quality. The results as shown in Table 7. The institutional quality is negatively related to TobinQ and ROA. The results suggest that weak institutional quality decreases the market and accounting performance firms in Nigeria. The result indicates that weaker firm performance could be attributable to the detrimental institutional environment. This implies that the institutional environment characterized by inadequate legal framework either criminal liability of the company or limited capability to indict politicians could contribute to business failures.

In addition, it is postulated that better regulatory environment tends to enhance the performance of corporations. Faccio (2006) opines that politically connected firms could favorably receive benefits like bail-out

Table 10
Corruption perception and performance of financial institutions.

VARIABLES	TobinQ			Return on Asset		
	1	2	3	4	5	6
L.Tobin	0.283* (0.145)	0.283* (0.145)	0.283* (0.145)			
L.ROA				-0.248*** (0.0480)	-0.248*** (0.0480)	-0.248*** (0.0480)
CPI	0.0558 (0.0730)			0.0271 (0.0346)		
CCI		0.242 (0.317)			0.118 (0.150)	
Quality			0.0164 (0.0214)			0.00795 (0.0102)
lnasset	-0.866*** (0.311)	-0.866*** (0.311)	-0.866*** (0.311)	0.00714 (0.0121)	0.00714 (0.0121)	0.00714 (0.0121)
lnage	0.198* (0.117)	0.198* (0.117)	0.198* (0.117)	-0.00294 (0.0197)	-0.00294 (0.0197)	-0.00294 (0.0197)
TAN	-0.687* (0.414)	-0.687* (0.414)	-0.687* (0.414)	-0.105 (0.0683)	-0.105 (0.0683)	-0.105 (0.0683)
LEV	0.0572 (0.108)	0.0572 (0.108)	0.0572 (0.108)	0.157 (0.167)	0.157 (0.167)	0.157 (0.167)
FDI	0.498 (0.324)	0.454 (0.291)	0.455 (0.291)	0.747 (0.598)	0.725 (0.572)	0.726 (0.573)
Inf	0.0237 (0.0171)	0.0150 (0.0125)	0.0152 (0.0125)	0.0178 (0.0174)	0.0135 (0.0123)	0.0136 (0.0124)
DC	0.0398 (0.0676)	-0.00831 (0.0225)	-0.00878 (0.0225)	-0.0221* (0.0123)	-0.0455 (0.0328)	-0.0457 (0.0331)
Observations	190	190	190	238	238	238
Hansen_test	12.02	12.02	12.02	25.17	25.17	25.17
Hansen Prob	0.212	0.212	0.212	0.0219	0.0219	0.0219
AR (1) test	-0.408	-0.408	-0.408	-2.356	-2.356	-2.356
AR (1) P-value	0.683	0.683	0.683	0.0185	0.0185	0.0185
AR (2) test	-1.185	-1.185	-1.185	-0.904	-0.904	-0.904
AR (2) P-value	0.236	0.236	0.236	0.366	0.366	0.366

Robust standard errors in parentheses ***p < 0.01, **p < 0.05, *p < 0.1. Note: Tobin is Tobin Q, ROA is Return on Asset, CPI is Corruption Perception Index, CCI is the Control of Corruption Index, Quality is Institutional Quality, Pol is Political Instability and Violence, Govt is Government Effectiveness, RQ is Regulatory Quality, RL is Rule of Law, VAC is Voice and Accountability, Lev is Market Leverage, lnage is Firm Age, lnasset is Firm Size, TAN is Tangibility, Inf is Inflation, DC is Domestic Credit to Private Sector by banks, and FDI is Foreign Direct Investment.

or grants from the government when the firm is faced with insolvency issues. In the same vein, [Cioffi and Hoepner \(2006\)](#) argues that political elites could embark on regulatory interventions with the motive to protect the country interest in financial development. It can be deduced that the government could discharge responsibilities to renounce any corruptive likelihood of public official abusing their authority. To explore these inferences, we perform a series of sub-sample Political Instability and Violence, Government Effectiveness, Regulatory Quality, Rule of Law, Voice and Accountability. To eliminate any multicollinearity statistical problems, we use each indicator in separated model specification reported in Tables 8 and 9.

The results in Table 8 report that, with respect to market value performance, the indicators of Political Instability and Violence, Government Effectiveness, Regulatory Quality, Rule of Law, Voice and Accountability are significant factors. Except for regulatory quality, other institutional environment indices are positively related to Tobin Q. The result suggests that political instability could influence uncertainty. This result is consistent with [Mertzanisa et al. \(2019\)](#), which indicates that political instability could positively lead to an inflow of capital whilst simultaneously affects market-based performance. Our result also identifies the benefits firms tend to receive in an environment where there is limited government effectiveness, inadequate rule of law and lack of accountability. However, the negative relationship of regulatory quality suggests that restrictions of arbitrary authority seem to detrimentally influence market-based performance.

When Return on Asset is considered in Table 9, all the indicators of the institutional environment such as Political Instability and Violence, Government Effectiveness, Regulatory Quality, Rule of Law, Voice and Accountability remain significant predictors. All the indices are positively related to ROA except for the regulatory quality. The results are

similar to market-based performance. It can be deduced that political instability also influences the accounting performance of corporations and the firms accounting performance to tend to react positively in an environment where there is restricted government effectiveness, inadequate rule of law and voice and accountability deficiency. Nevertheless, the negative relationship of regulatory quality suggests that restrictions of arbitrary authority could impair the accounting-based performance. This means that company performance suffers the plagues of stricter regulations in the country.

3.2.3. Corruption, institutional environment and performance by regulatory complexity

Financial institutions are assumed to highly involve in information asymmetry practices and more opaqueness than non-financial firms. It is suggested that financial institutions could quickly hide the quality of assets compared to non-financial institutions ([Ojeka et al., 2019](#)). Generally, financial institutions are more leveraged compared to non-financial institutions in which the level of board risk appetite to maximize shareholders wealth could increase the chance of disaster. However, financial institutions are exposed to various financial risks reflects their exclusive position as financial intermediaries ([Zagorchev and Gao, 2015](#)). Thus, the excessive risk appetite of banks could have significant negative externalities on the macroeconomic and systemic risk, which encourage a highly regulated environment for financial institutions ([Haan and Vlahu, 2012](#)).

To explore these speculations, we examine the influence of corruption perception and institutional quality on performance between the financial and non-financial institutions. Table 10 shows the panel data regression of corruption and institutional environment on financial institution performance. The results show a positive influence but

Table 11
Corruption perception and performance of non-financial institutions.

VARIABLES	1	2	3	4	5	6
L.Tobin	0.497*** (0.106)	0.497*** (0.106)	0.497*** (0.106)			
L.ROA				0.486*** (0.169)	0.486*** (0.169)	0.486*** (0.169)
CPI	-0.409** (0.182)			-0.0582** (0.0265)		
CCI		-1.775** (0.791)			-0.253** (0.115)	
Quality			-0.120** (0.0535)			-0.0171** (0.00778)
lnasset	0.0253 (0.0520)	0.0253 (0.0520)	0.0253 (0.0520)	-0.00723 (0.0144)	-0.00723 (0.0144)	-0.00723 (0.0144)
lnage	0.0406 (0.0946)	0.0406 (0.0946)	0.0406 (0.0946)	0.0192 (0.0169)	0.0192 (0.0169)	0.0192 (0.0169)
TAN	-0.317*** (0.112)	-0.317*** (0.112)	-0.317*** (0.112)	-0.0384* (0.0208)	-0.0384* (0.0208)	-0.0384* (0.0208)
LEV	0.0166 (0.0951)	0.0166 (0.0951)	0.0166 (0.0951)	-0.0280 (0.0424)	-0.0280 (0.0424)	-0.0280 (0.0424)
FDI	-1.711 (1.230)	-1.389 (1.190)	-1.399 (1.191)	0.139 (0.491)	0.184 (0.485)	0.183 (0.486)
Inf	-0.0908* (0.0468)	-0.0267 (0.0405)	-0.0280 (0.0404)	0.0134 (0.0242)	0.0225 (0.0235)	0.0223 (0.0235)
DC	-0.248 (0.169)	0.105 (0.116)	0.108 (0.117)	-0.105* (0.0615)	-0.0548 (0.0622)	-0.0543 (0.0622)
Observations	424	424	424	424	424	424
Hansen_test	18.95	18.95	18.95	26.88	26.88	26.88
Hansen Prob	0.125	0.125	0.125	0.129	0.129	0.129
AR (1) test	-2.225	-2.225	-2.225	-1.844	-1.844	-1.844
AR (1) P-value	0.0261	0.0261	0.0261	0.0652	0.0652	0.0652
AR (2) test	-0.470	-0.470	-0.470	0.482	0.482	0.482
AR (2) P-value	0.638	0.638	0.638	0.630	0.630	0.630

Robust standard errors in parentheses ***p < 0.01, **p < 0.05, *p < 0.1. Note: Tobin is Tobin Q, ROA is Return on Asset, CPI is Corruption Perception Index, CCI is the Control of Corruption Index, Quality is Institutional Quality, Pol is Political Instability and Violence, Govt is Government Effectiveness, RQ is Regulatory Quality, RL is Rule of Law, VAC is Voice and Accountability, Lev is Market Leverage, lnage is Firm Age, lnasset is Firm Size, TAN is Tangibility, Inf is Inflation, DC is Domestic Credit to Private Sector by banks, and FDI is Foreign Direct Investment.

insignificant influence for all the model specifications. These results point that the level of regulations restriction could navigate the industry through the higher corruption perception and weak institutional quality thereby limiting their influence on the industry market and accounting-based performance.

However, we consider the influence of corruption perception and institutional quality on the performance of non-financial instructions in Table 11. The results show that corruption and institutional quality is negatively related to market-based and accounting-based performance. It is identified that corruption perceptions tend to hamper the performance of the non-financial industry. Therefore, the results renounce the “grease the wheels” claims of corruption and performance of non-financial firms. This implies that the increase in corruption practices reduces the accounting value and market value performance of non-financial firms. In the same vein, we find that the weak institutional environment tends to impair the market and accounting-based performance of non-financial firms, which could be traced to the less regulatory body in such institution compared to the financial institution.

4. Conclusion

Based on the extracted data for 135 listed companies in Nigeria for the period 2013–2017, we explore the effect of corruption and institutional quality on the performance of firms in Nigeria. We first use the Transparency International Corruption Perception Index for the main analysis, which estimates the countries-times variations. The Index evaluates the public officials and politician corruption perception. We further use the Corruption Index developed by World Bank proxied for corruption perception in the robustness analysis. The World Bank Control of Corruption Index, which ranges between -2.5 to 2.5 with a lower value reflecting higher corruption. To avoid inconsistency with the statistical model, we rescale the Index and re-gear the index ranging 0–10 with the

lower value indicating minimized corruption. To capture institutional quality, which tends to depict the level of law enforcement to curb corruptive performances of the public officials, we use the measure based on the first component of six governance indices, which include Control of Corruption, Political instability and violence, Government effectiveness, Regulatory Quality, Rule of Law and Voice and Accountability via Principal Component Analysis. The measures for the governance indicators range from -2.5 to 2.5 with a lower value indicating severe problems. In the robustness analysis, we rescale and reverse the measures range from 0 to 10 with higher value depicting severe problems consistent with the study of Thakur and Kannadhasan (2019).

We find that corruption is negatively related to the market value and accounting value performance in all the model specifications. This result infers that the corruption perception retrogressively impairs both the market value and accounting value performance of the listed firms. The negative relationship could be traced to the firm limitation to penetrate the available global markets (North, 1990). Thus, firm engagement in corruption practices such as payments and fees to corrupt public officials could curtail firm productivity. To explore the extent of institutional quality, we first examine the aggregated measure of the institutional environment indicators, which is the standardized six measures representing the institutional quality on firm performance. The institutional quality is negatively related to TobinQ and ROA. The results suggest that weak institutional quality decreases the market and accounting performance firms in Nigeria. In addition, we further decompose the governance indicator such as political instability and violence, government effectiveness, rule of law, voice and accountability except for regulatory quality, other institutional environment indices are positively related to both market and accounting-based performance. We then compare the extent of corruption perception and institutional quality on performance between financial and non-financial institution. We find that both corruption perception and the weak institutional environment tends to

impair the market and accounting-based performance of non-financial firms, which could be traced to the less regulatory body in such institution compared to the financial institution.

This study has policy implications for regulators and stakeholders. Nigeria is likely to require more effective and strong mechanisms proactive to curb the corruption practices amidst the public officials and politicians while enhancing the institutional environment. This tends to increase the global competitiveness of Nigerians firms in the global market, which in turn promotes their performance. In essence, stakeholders should be concerned about the effect of corruption practices and institutional environment, which is likely to influence the performance of the corporation. Thus, stakeholders should be skeptical about the measures implemented by the government to curb corruption and demand for transparency and accountability from the public officials and politicians.

This study is not without limitations. The study generalization is restricted to the period 2013–2017. In addition, this study fails to explore the entire listed companies in Nigeria because some companies are newly listed in which their data is not readily available.

Declarations

Author contribution statement

Stephen Ojeka, Kofo Adegboye: Performed the experiments.

Alex Adegbeye: Conceived and designed the experiments; Analyzed and interpreted the data.

Olaoluwa Umukoro: Contributed reagents, materials, analysis tools or data; Wrote the paper.

Olajide Dahunsi: Conceived and designed the experiments; Wrote the paper.

Emmanuel Ozordi: Contributed reagents, materials, analysis tools or data.

Funding statement

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Competing interest statement

The authors declare no conflict of interest.

Additional information

No additional information is available for this paper.

References

- Adams, M., Veprauskait, E., 2013. Do powerful chief executives influence the financial performance of UK firms?, 45, 229–241.
- Ades, A., Di Tella, R., 1999. Rents, competition, and corruption. *Am. Econ. Rev.* 89, 982–993.
- Arellano, M., Bond, S., 1991. Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *Rev. Econ. Stud.* 58, 277–297.
- Awasthi, R., Bayraktar, N., 2015. Can tax simplification help lower tax corruption?, 5 Eurasian Economic Review.
- Barth, J.R., Caprio, G., Levine, R., 2004. Bank regulation and supervision: what works best? *J. Financ. Intermediation* 13 (2), 205–248.
- Bennouri, M., Chtioui, T., Nagati, H., Nekhili, M., 2018. Female board directorship and firm performance: what really matters? *J. Bank. Financ.* 88, 267–291.
- Brada, J.C., Drabek, Z., Mendez, J.A., Perez, M.F., 2019. National levels of corruption and foreign direct investment. *J. Comp. Econ.* 47 (1), 31–49.
- Canare, T., 2017. The effect of corruption on foreign direct investment inflows. *The Changing Face of Corruption in the Asia Pacific*, pp. 35–55. May.
- Cioffi, J., Hoepner, M., 2006. The political paradox of finance capitalism: interests, preferences, and center-left party politics. *Polit. Soc.* 34 (4), 463–502.
- Treisman, D., 2003. Post communist corruption. *Political Economy of Transition and Development: Institutions, Politics, and Policies*. Kluwer, pp. 201–226.
- Thakur, B.P.S., Kannadhasan, M., 2019. Corruption and cash holdings: evidence from emerging market economies. *Emerg. Mark. Rev.* 38, 1–17. November 2018.
- Ubi, P., Udah, E., 2014. Corruption, institutional quality and economic performance in an emerging economy: lessons from Nigeria. *J. Econ. Manag. Trade* 1708–1722.
- Wei, S.J., 1998. ‘Foreign, Quasi-Foreign, and False-Foreign Direct Investment in China’, Ninth East Asian Seminars on Economics. Osaka, Japan.
- Xie, E., Reddy, K.S., Liang, J., 2017. Country-specific determinants of cross-border mergers and acquisitions: a comprehensive review and future research directions. *J. World Bus.* 52 (2), 127–183.
- Xu, X., Li, Y., 2018. Local corruption and corporate cash holdings: sheltering assets or agency conflict? *China. J. Account. Res.* 11 (4), 307–324.
- Yarosan, E., 2013. Corruption and financial sector performance: empirical evidence from Nigeria. *Int. J. Multidiscip. Thought* 3 (2), 507–519.
- Zagorchev, A., Gao, L., 2015. Corporate governance and performance of financial institutions. *J. Econ. Bus.* 82, 17–41.

- Corrado, G., Rossetti, F., 2018. Public corruption: a study across regions in Italy. *J. Policy Model.* 40 (6), 1126–1139.
- Cucculelli, M., Bettinelli, C., 2016. Corporate governance in family firms, learning and reaction to recession: evidence from Italy. *Futures* 75.
- Dincer, O.C., Fredriksson, P.G., 2013. Does trust matter? Corruption and environmental regulatory policy in the United States. *Ssrn* 54, 212–225.
- Dutta, N., Sobel, R., 2016. Does corruption ever help entrepreneurship? *Small Bus. Econ.* 47 (1), 179–199.
- Faccio, M., 2006. Politically connected firms. *Am. Econ. Rev.* 96, 369–386.
- Florio, C., Leoni, G., 2016. Enterprise risk management and firm performance: the Italian case. *Br. Account. Rev.* 49 (1), 56–74.
- Gaviria, A., 2001. Assessing the effects of corruption and crime on firm performance. *Ssrn* 3, 245–268.
- Haan, J. De, Vlahu, R., 2012. Corporate governance of financial institutions. *Annu.Rev.Financ.Econ* 4 (4), 215–232.
- Hallward-driemeier, M., Wallsten, S., Xu, L.C., 2006. Ownership, investment climate and firm performance. *Econ. Transit.* 14 (4), 629–647.
- Huang, X., Kang, J.K., 2017. Geographic concentration of institutions, corporate governance, and firm value. *J. Corp. Financ.* 47, 191–218.
- IMF Working Paper, 2009. Inflation targeting pillars: transparency and accountability (EPUB). Retrieved from: [http://books.google.com/books?hl=en&lr=&id=Z9I8nRh2WIC&oi=fnd&pg=PP6&](http://books.google.com/books?hl=en&lr=&id=Z9I8nRh2WIC&oi=fnd&pg=PP6&dq=Inflation+Targeting+Pillars+:+Transparency+and+Accountability&ots=akorDW8X6-&sig=OJu5CDyJwXNoLET_gVvYBGD03Y%5Cnhpt://books.google.com/books?hl=en&lr=&id=Z9I8nRh2WIC&oi=fnd&pg=PP6&)
- IMF, 2019. WORLD ECONOMIC OUTLOOK INTERNATIONAL MONETARY FUND: Growth Slowdown, Precarious Recovery.
- Kim, D.S., Li, Y., Tarzia, D., 2018. Value of corruption in China: evidence from anti-corruption investigation. *Econ. Lett.* 164, 112–116.
- Klomp, J., Haan, J. De., 2015. Bank regulation and financial fragility in developing countries: does bank. *J. Adv. Res.* 5, 1–9, 2009.
- Lim, K.Y., 2017. The Dynamics of Corruption and Unemployment in a Growth Model with Heterogeneous Labour. October, pp. 1–46. <http://www.lancaster.ac.uk/lums/>.
- Mertzanisa, C., Basuonyb, M., Mohamed, E., 2019. Social institutions, corporate governance and firm-performance in the MENA region. *Res. Int. Bus. Financ.* 48, 75–96.
- North, D.C., 1990. Institutions, Institutional Change and Economic Performance. Harvard University Press, Cam-bridge, MA.
- Nyberg, A., Fulmer, I.S., Gerhart, B., Carpenter, M.a., 2010. Agency theory revisited: CEO returns and shareholder interest alignment. *Acad. Manag. J.* 53 (5), 1029–1049.
- Ojeka, S.A., Adegbeye, A., Adegbeye, K., Alabi, O., Afolabi, M., Iyoha, F., 2019. Chief financial officer roles and enterprise risk management: an empirical based study. *Heliyon* 5 (6) e01934.
- Ozili, P.K., 2019. Bank income smoothing, institutions and corruption. *Res. Int. Bus. Financ.* 49, 82–99. November 2018.
- Pantea, M., Gligor, D., Anis, C., 2014. Economic determinants of Romanian firms' financial performance. *Procedia. Soc.Behav. Sci* 124, 272–281.
- Petersen, M., 2009. Estimating standard errors in finance panel datasets: comparing approaches. *Rev. Financ. Stud.* 22, 435–480.
- Pradhan, S., et al., 2000. The economic and social consequences of corruption in transition countries. In: Pradhan, Sanjay, et al. (Eds.), *Anticorruption in Transition. A Contribution to the Policy Debate*. Washington, D.C.
- Quon, T.K., Zeghal, D., Maingot, M., 2012. Enterprise risk management and firm performance. *Procedia. Soc.Behav. Sci* 62, 263–267.
- Raithatha, M., Komera, S., 2016. Executive Compensation and Firm Performance : Evidence from Indian Firms, pp. 160–169.
- Ringov, D., 2017. Dynamic capabilities and firm performance. *Long. Range Plan.* 50, 1–12.
- Roodman, D., 2006. How to do xtabonds: an introduction to “Difference” and “System” GMM in stata. Center for Global Development, Washington.
- Samson, O.O., 2015. Executive compensation and the performance of non-financial firms on nigerian stock exchange. *JORIND* 13 (2).
- Sumedrea, S., 2013. Intellectual capital and firm performance: a dynamic relationship in crisis time. *Procedia. Financ. Econ* 6 (13), 137–144.
- Treisman, D., 2003. Post communist corruption. *Political Economy of Transition and Development: Institutions, Politics, and Policies*. Kluwer, pp. 201–226.
- Thakur, B.P.S., Kannadhasan, M., 2019. Corruption and cash holdings: evidence from emerging market economies. *Emerg. Mark. Rev.* 38, 1–17. November 2018.
- Ubi, P., Udah, E., 2014. Corruption, institutional quality and economic performance in an emerging economy: lessons from Nigeria. *J. Econ. Manag. Trade* 1708–1722.
- Wei, S.J., 1998. “Foreign, Quasi-Foreign, and False-Foreign Direct Investment in China”, Ninth East Asian Seminars on Economics. Osaka, Japan.
- Xie, E., Reddy, K.S., Liang, J., 2017. Country-specific determinants of cross-border mergers and acquisitions: a comprehensive review and future research directions. *J. World Bus.* 52 (2), 127–183.
- Xu, X., Li, Y., 2018. Local corruption and corporate cash holdings: sheltering assets or agency conflict? China. *J. Account. Res* 11 (4), 307–324.
- Yarosan, E., 2013. Corruption and financial sector performance: empirical evidence from Nigeria. *Int. J. Multidiscip. Thought* 3 (2), 507–519.
- Zagorchev, A., Gao, L., 2015. Corporate governance and performance of financial institutions. *J. Econ. Bus.* 82, 17–41.