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ACCOUNTING, CORPORATE GOVERNANCE & BUSINESS ETHICS | RESEARCH ARTICLE

The dynamic relationship between bank risk and corporate governance in Africa

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Abstract: This paper investigates the nexus between corporate governance and bank risk in Africa using annual data of 635 banks from 48 countries for the period 2000 to 2019 in a panel GMM approach. Our bank risk variables are loan loss provision to net interest revenue (LLPNR) and loan loss reserve to gross loan (LLRGL). The corporate governance variables are board size, female directors, role duality, board meetings, and independent directors. Findings indicate that bank risk

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PUBLIC INTEREST STATEMENT

In the world of banking, risk-taking is a normal activity that facilitates the process in generating capital appreciation for investors. This risk-taking agenda has increased governance concerns and thus the relationship between shareholders and managers remains uncertain. A good corporate governance framework is essential to the successful running of a company. It is the system of practices, rules and processes by which a company is run. Majority of the business entities and in particular financial institutions in Africa have been found to lack the ability to manage wealth by effectively developing and encouraging indigenous and foreign investors to stake their capital for reasonable returns. Recent trend indicates that most African countries have decided to formalise their economies leading to an increased good corporate governance outlook. The current study probes into the extent to which corporate governance (measure by board size, board meeting, independent board directors, the presence of female directors on board and CEO/chairman role duality) influences the risk-taking decision of banks in Africa. Regulators in Africa play a crucial role in providing confidence in their economies while protecting investors. Therefore, this study may guide them to come out with appropriate corporate governance codes that will assist banks to reduce bank risk and improve performance. Banks may also make appropriate board appointments and apply best corporate governance practices to improve their performance while reducing risk at the same time.

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measured by LLPNR has significant negative association with female directors, role duality, and frequent board meetings. However, bank risk measured by LLRGL has significant negative connections with board size, and independent directors, but positive connections with female directors and board meetings. This study provides a guide to regulators, shareholders, and management of banks in adopting appropriate corporate governance practices to reduce risk.

Subjects: G21; G32; O5

Keywords: Bank Risk; Corporate Governance; Bank Performance; Africa

1. Introduction

The interest in how banks go about mitigating their risk-taking behaviour in recent years has attracted the attention of academic and regulatory bodies. Bank risk can be said to be dependent on corporate governance as good corporate governance practices can reduce bank risk while bad corporate governance practices can increase bank risk (Srivastay and Hagendorff, 2016). A good corporate governance framework is essential to the successful running of a company. It is the system of practices, rules and processes by which a company is run. Corporate governance epitomises the principles of accountability, responsibility, transparency and fairness (Elamer, Ntim, Abdou, Zalata, and Elmagrhi, 2019; Solikhah and Maulina, 2021; Widiatmoko, Indarti and Pamungkas, 2020). Therefore, corporate governance characteristics such as board size, board meeting, independent board directors, the presence of female directors on board and CEO/chairman role duality have critical impact on the management of risk and setting the tone for a bank's risk-taking culture at the top (Kyei, Werner, and Appiah, 2022; Kyei, 2019; Kumah, Sare, and Bernard, 2014).

Majority of the business entities and in particular financial institutions in Africa have been found to lack the ability to manage wealth by effectively developing and encouraging indigenous and foreign investors to stake their capital for reasonable returns. This according to Bhimani (2008) has a direct relationship with the need for an effective and efficient corporate governance practices. Notably, African economies began to pay particular attention to the ideals of good governance in the beginning of the 1980s. According to Soyibo et al. (2002), the term good governance was first mentioned in a 1989 World Bank report on sub-Saharan Africa but since the 1990s, many donor agencies have sought the pursuit of good governance. Opinions, however, differ on the content, boundaries and relevance of the theory of corporate governance in the developing countries because of the under development, unstructured and informal nature of the economies (Kafidipe, Uwalomwa, Dahunsi, and Okeme, 2021; Krajewski & Ritzman, 2002). However, the issues of good corporate governance cannot be overlooked in this part of the world because of its perceived role in development and economic prosperity. In line with the recent trend where most African countries have decided to formalise their economies, the clamour for good corporate governance has increased. Corporate governance systems have evolved in a number of developing African countries (Adepoju, 2010).

Corporate governance according to Clark (2004) is relatively a new concept to many companies in Africa. Scientific research on the subject matter is very scanty. Studies have examined the relationship between banks risk and board size with inconclusive results. Notable studies in this regard include Pathan (2009), Switzer and Wang (2013) and Lu and Boateng (2017) who reported negative relationship, Chan et al. (2016) and Battaglia and Gallo (2017) who showed positive relationship and no significant relationship by Akbar et al. (2017). Following Adams and Mehran (2012) and John et al. (2016), banks have larger board size than non-financial firms due to the complex nature of banking activities. This is in line with the resource dependency theory which argues that bigger and diversified board is good for firms due to greater expertise and access to resources (Zahra and Pearce, 1989). Nevertheless, the agency theory contends that bigger board is

not efficient due to challenges such as communication and coordination, internal clashes among directors and director-free rider problems (Jensen, 1993).

The debate of whether the presence of female directors on executive board has negative or positive effect on bank risk is still ongoing but has not received any attention in Africa. Female board diversity supported by resource dependency theory posits that the inclusion of female directors on board provides many different resources and benefits (Carter et al., 2010). Mateos de Cabo et al. (2012) added that the presence of female directors on executive board brings new opinions and perspectives to improve the firm performance that would not happen if the board was to be homogeneous.

The literature on board independence and bank risk is scant and inconclusive with no evidence from Africa (Adams & Mehran, 2012; Liang et al., 2013; Pathan & Faff, 2013; Yeh et al., 2011). As noted by Fuzi et al. (2016) and Mathew et al. (2016), regulators and corporate governance codes recommend a balance of executive and non-executive members on corporate boards. The non-executive directors are entrusted by shareholders to represent them at board meetings to provide an unbiased business decision, help reduce agency problems and improve bank risk management (Wang et al., 2014; Chang et al., 2016; Fuzi et al., 2016).

With specific regard to the role or CEO duality and bank risk, different theories have different arguments on having the same person as CEO and chairman of a company at the same time and the separation of the two roles. Stewardship theory establishes that the same person occupying the two seats as CEO and chairman of a company reduces conflict during decision-making (Syriopoulos and Tsatsaronis, 2012b). The theory further argues that strong and unified leadership with a good strategic direction is achieved when one person is holding the position of CEO and chairman at the same time. Contrary to the argument by stewardship theory, the agency theory stipulates that separating the CEO and chairman roles is a good corporate governance practice when considering the interest of the shareholders and this aids effective control and monitoring of management (Jensen, 1993). Empirically, Lu and Boateng (2017) found a positive effect of CEO duality on credit risk of UK banks while Akbar et al. (2017) show negative impact of CEO duality on bank risk taking. In general, the relation between CEO duality and bank risk in Africa has been largely ignored.

Another area that has a very limited study within the corporate governance literature is the association between board meeting and bank risk. Previous studies show both positive (Grove et al., 2011; Liang et al., 2013; and Salim Arjomandi and Seufert, 2016) and negative (Battaglia & Gallo, 2017) associations between board meeting and performance in banks. However, the relationship between board meetings and bank risk has been largely ignored. Notably, boards that meet frequently identify and resolve risk-related issues immediately to increase bank performance.

It is evident from the above literature that the association between bank risk and corporate governance has not been explored in Africa even though bank risk reduces shareholder wealth which can be mitigated by effective corporate governance practices. Importantly, the recent corporate governance scandals which lead to the 2018/2019 financial crises affected all banks including African banks. Hence, examining the dynamic relationship between bank risk and corporate governance variables in Africa is crucial for an in-depth understanding of corporate governance impact on bank risk in Africa. The outcome of this study indicates that bank risk measured by LLPNR has significant negative association with female directors, CEO role duality and frequent board meetings. However, bank risk measured by LLRGL has significant negative connections with board size, and independent directors, but positive connections with female directors and board meetings in Africa.

The study contributes to the growing literature by providing a broader understanding of the association between bank risk and corporate governance in Africa due to the large sample size

used (i.e., 635 banks selected from 48 countries in Africa during the years 2000–2019). The current study has also reduced existing gap in the literature by probing into the extent to which corporate governance (measure by board size, board meeting, independent board directors, presence of female directors on board, and CEO/chairman role duality) influences the risk-taking decision of banks in Africa. Regulators in Africa play a crucial role in providing confidence in their economies while protecting investors. Therefore, our study may guide them to come out with appropriate corporate governance codes that will assist banks to reduce bank risk and improve performance. Banks may also make appropriate board appointments and apply best corporate governance practices to improve their performance while reducing risk at the same time.

The remainders of the study are structured as follows. Section 2 delineates a description of the methodology. Section 3 describes the data and statistical properties. Section 4 captures the results and discussion on corporate governance and bank risks in Africa. Section 5 covers the conclusion and policy implications.

2. Methodology

The study adopts the Generalised Method of Moments (GMM) estimation model in a panel data approach due to its advantages including resolving the problems of unobserved heterogeneity, autocorrelation and profit persistence, which other techniques may not be able to resolve. In line with Gujarati (2003), panel data in a GMM model allow firm's heterogeneity in individual variables to be controlled. Following Sakawa and Watanabel (2018), Lu and Boateng (2017), Hakimi et al. (2018) and Akbar et al. (2017), our response variables are the bank risk variables such as Loan Loss Reserve to Gross Loan (LLRGL) and loan loss provision to net interest revenue (LLPNR). Our covariates are the corporate governance variables such as board size (BSIZE), board meetings (MEETINGS), female directors (FEMALE), independent directors (INDEP) and duality (DUAL). We controlled for total assets (LNTA), cost-to-income ratio (COST), equity to total asset (EQTA), net loan to total asset (NLTA), GDP (LNGDP) and corruption (COR). We include 2007/2008 financial crisis as control variable to determine how it impacted on bank performance in Africa. See, Table 4 in the appendix for description and measurement of variables.

Our empirical model takes the form:

$$\begin{aligned} LLRGL_{it} = \beta_0 + \beta_1 BSIZE_{it} + \beta_2 MEETINGS_{it} + \beta_3 DUAL_{it} + \beta_4 FEMALE_{it} + \beta_5 INDEP_{it} + \\ \beta_6 SIZE_{it} + \beta_7 EQTA_{it} + \beta_8 NLTA_{it} + \beta_9 COST_{it} + \beta_{10} COR_{it} + \beta_{11} GDP_{it} + \varepsilon_{it} \end{aligned} \tag{1}$$

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Where $LPNR_{it}$ is loan loss provision to net interest revenue of bank i at time t, $LPNR_{it}$ is loan loss reserve to gross loan of bank i at time t, $SIZE_{it}$ is the number of members on the board of bank i at time t, $MEETINGS_{it}$ is the number of board meetings of bank i at time t, $DUAL_{it}$ is the role duality of bank i at time t, $FEMALE_{it}$ is the number of female directors of bank i at time t, $INDEP_{it}$ is the number of independent directors of bank i at time t, $SIZE_{it}$ is bank size of bank i at time t, $EQTA_{it}$ is equity divided by total assets of bank i at time t, $NLTA_{it}$ is net loans to assets of bank i at time t, $COST_{it}$ is cost-to income-ratio of bank i at time t, COR_{it} is corruption of country i at time t, GDP_{it} is gross domestic product of country i at time t, β_0 is the intercept, β_1 to β_{11} represent the coefficient of each variable, ε_{it} is the error term of bank i at time t, *i* is the cross-sectional dimension and *t* is the time series dimensions.

3. Data description and preliminary analysis

To investigate the dynamic relationship between bank risk and corporate governance in Africa, we sampled 635 banks in Africa with 10,790 bank-year observations. For a bank to be included in the sample, the bank must have five or more year's financial information between 2000 and 2019 to capture information before, during and after the 2007/2008 financial crises. Unlike the

majority of studies which focused only on listed and larger banks, our study sampled both listed and unlisted banks, small, medium and large banks. This approach enabled us to get a bigger sample size to enhance the generalisation of the results of this study.[1] We remove non-synchronous data points to prevent the problem of underestimation of true correlations and regressions. The data on bank specific variables were extracted from BankScope data base except for 2016–2019 data of some banks which were obtained from Orbis bank[2] focus database, which is also provided by Bereau van Dijk. The data on the internal corporate governance variables were accessed directly from the annual reports of the sampled banks website except for few banks which were obtained from Boardex database. The data on some control variables including GDP and corruption (which is a variable of the six world governance indices (wgi)) were sourced from the World bank website.[3]

Table 1 shows the descriptive statistics on the association between bank risk and corporate governance. Panel A shows the two risk measures, Loan loss provision to net interest revenue (LPNR) and Loan Loss Reserve to Gross Loan (LLRGL). The minimum values of LPNR and LLRGL are −16.94 and 0.25, respectively, and their maximum values are 134.88 and 31.50, respectively. While LLPNR has an average value of 21.41 with a standard deviation of 29.55, LLPGL has average value of 6.65 and a standard deviation of 7.02. Panel B of Table 1 presents all the independent corporate governance variables. The Board size of African banks ranges from a minimum of 2 to a maximum of 23. On average, the board size of African banks is 10.49 and a median number of 10. This value is within the board size (i.e., between 8 and 10) recommended by Lipton and Lorsch (1992), for efficiency of a board. Jensen (1993) also argue that any board bigger than seven to eight members is not beneficial to the effective function of the board due to high chances for animosity and retribution between the board members. The number of independent directors on African bank board ranges from a minimum of 0 to a maximum of 18 with a standard deviation of 25.30. The average number of independent directors on African bank board is about 4.89. This value portrays that the number of independent directors who are supposed to scrutinise the executives' decision during board meetings is less than the executive directors. This can pose a problem for the independent non-executive directors in scrutinising the executive decisions when a particular decision has to go on voting. The next corporate governance variable is role duality which is a dummy variable with minimum number of 0 and a maximum number of 1, with a mean value of 0.16 and a standard deviation of 0.37. This means, on average the 0.16 of the sample banks have a combined role of CEO/Chairman position. The next variable to DUAL on the table is female directors on African boards with a minimum value of 0 and a maximum value of 9. The number of female directors has an average value of 1.49 and standard deviation of 1.45. This means the average number of female directors on the banks board is only 1.49 which is very small number compared to average board size of 10.49. The last but not the least independent corporate governance variable on the table is board meetings. The board meeting has a minimum value of 0 and a maximum value of 38 with a standard deviation of 4.20. The average number of board meetings which is held by African banks within a year is around 6 (6.26).

Apart from the independent corporate governance variables, there are other factors which may also affect the relationship between corporate governance and bank risk in Africa. As a result, we control for a number of these factors. Panel C of Table 1 shows all the control variables used in this study. The minimum GDP recorded from the 48 countries selected for this study is −0.81 and a maximum of 11.15 with a standard deviation of 2.46. The average GDP of all the countries is 6.74. Following extant literature, a high number for corruption means very clean country whilst a low number means very corrupt country. The minimum corruption figure observed in this study is 0.85, a maximum of 85.85 with a standard deviation of 22.22. The average corruption value in the 48 countries selected for this study is 35.39. This value suggests that corruption is very prevalent in Africa which can affect their bank risk and performance.

Table 1. Summary descriptive statistics of all variables

Variables	Mean	Median	Std. Dev.	Minimum	Maximum	Skewness	Kurtosis	Observations
Panel A: Risk variables (Dependent variables)								
LLPNR	21.41	12.43	29.55	−16.94	134.88	2.14	8.06	5990
LLRGL	6.65	4.17	7.02	0.25	31.50	1.93	6.59	5743
Panel B: Corporate governance variables (Independent variables)								
BSIZE	10.49	10.00	3.49	2.00	23.00	0.72	3.24	2027
INDEP	4.89	4.5	3.18	0.00	18	0.82	3.31	1020
DUAL	0.16	0	0.37	0.00	1.00	1.83	4.33	2032
FEMALE	1.49	1	1.45	0.00	9	1.14	4.64	2013
MEETINGS	6.26	5	4.20	0.00	38.00	3.59	20.94	1447
Panel C: Control Variables								
LNTA	3.56	3.17	1.71	−1.70	9.65	0.28	2.92	7515
COST	62.67	58.99	28.38	14.46	159.21	1.23	5.41	6815
EQTA	16.33	11.76	14.51	2.70	72.91	2.45	9.10	7498

(*Continued*)

Table1. (*Continued*)

Variables	Mean	Median	Std. Dev.	Minimum	Maximum	Skewness	Kurtosis	Observations
NLTA	47.60	48.85	21.39	2.77	90.01	−0.16	2.50	7243
LNGDP	6.74	7.32	2.46	−0.81	11.15	−0.24	2.16	10,773
COR	35.39	32.70	22.22	0.48	85.85	0.25	1.87	10,141
CRISIS7_8	0.12	0	0.32	0	1	2.37	6.63	10,795

Notes *LLPNR denotes loan loss provision/net interest revenue, LLRGL represents loan loss reserve/gross loan, BSIZE represents board size of the bank, INDEP denotes percentage of independent directors, DUAL represents role duality, FEMALE denotes the percentage of female directors on bank board, MEETINGS represents the number of board meetings per year, LNTA denotes the size of the bank, COST denotes cost to income ratio, EQTA denotes equity/total asset, NLTA represents net loans/total assets, LNGDP represents Gross Domestic product, COR denotes corruption, CRISIS7_8 represents 2007/2008 financial crisis.*

4. Results and discussion

The results and discussion for the association between bank risk and corporate governance in Africa are presented in this section and in Tables 2 and 3. Each of the two risk measures, loan loss provision to net interest revenue (LPNR) and loan loss reserve to gross loan (LLRGL), are regressed on the governance variables (board size, female directors, independent directors, CEO or role duality and board meetings). These variables are used based on availability of data and also are widely used in the literature.

Model 4 of Tables 2 and 3 shows the empirical findings of the relationship between corporate governance and bank risk based on GMM regression. The findings indicate that the effect of board size (BSIZE) on bank risk is negative but insignificant when bank risk is measured by LLPNR (−0.0569) but this became highly significant and negative when the risk is measured by LLRGL (−0.0784***). The insignificant impact on bank risk is consistent with the findings of Akbar et al. (2017). The significant negative relationship means that smaller board size causes an increase in bank risk in Africa. This finding implies that African banks require bigger bank board in order to reduce their bank risk. In line with resource dependency theory, the result mean that African banks could benefit from bigger board which is associated with more monitoring in order to reduce bank risk. The significant negative impact of board size on bank risk is consistent with the findings of Pathan (2009), Wang and Hsu (2013), and Lu and Boateng (2017), Switzer and Wang (2013), and Rachdi et al. (2013) but contradict the works of Chan et al. (2016) and Battaglia and Gallo (2017) who report a significant positive effect of board size on bank risk.

Female directors (FEMALE) have significant negative impact on bank risk measured by LLPNR (−0.117***), which is consistent with some previous findings (e.g., Gulamhussen and Santa, 2015; Cabo et al., 2012; Chan et al., 2016; Dong et al., 2017; Lu & Boateng, 2017; Palvia et al., 2015). Our result indicates that African banks with smaller number of female directors increase bank risk. Qualities, experience and contributions that more female directors bring to the board may help reduce bank risk in Africa. It is perceived that women are risk averse and for that matter do not take risk unnecessarily. Therefore, they will challenge their male counterparts on the board to take the right decision when it comes to risk taking. Females are also perceived to be careful and more responsible of their actions. As a result, more female directors on African banks board may help reduce bank risk. The finding lends theoretical support to resource dependency theory, which argues that board diversity, which includes the presence of female directors, brings distinct information sets which are available to management to improved decision-making (Carter et al., 2010), which could reduce bank risk.

Contrary, we find a significant positive impact of FEMALE directors on bank risk measured by LLRGL (0.0131***) supporting the works of Berger et al. (2014) and Yu et al. (2017). The inclusion of more female directors is considered to be good corporate governance practice, which could reduce bank risk. Also, there is a general notion that females are risk averse and for that matter could help reduce bank risk. However, female directors in Africa may not have enough qualification, skills and experience necessary to contribute efficiently during board meetings, probably due to the fact that the right procedures are not used to appoint the female directors in Africa. Therefore, their presence on the board can increase the risk of the banks instead of reducing the risk.

The presence of independent directors (INDEP) is insignificant and positively related to LLPNR (0.00312) but significant and negatively related to LLRGL (−0.0126***). The significant negative relationship suggests that the smaller number of independent directors on bank board of directors increases bank risk in Africa. This may imply that smaller number of independent directors may be dominated by executive board members, and for that matter they may not be able to challenge the executive directors to prevent them from taking decisions which may cause the risk of the banks to increase. The significant negative effect of independent directors on bank risk is consistent with some previous studies (e.g., Pathan, 2009; Switzer and Wang, 2013; Chan et al., 2016; Akbar et al., 2017; Battaglia & Gallo, 2017). The insignificant positive

Table 2. Results of corporate governance and bank risk using LLPNR as risk measure

MODEL	(1)	(2)	(3)	(4)
VARIABLES	OLS	Fixed effect	2SLS	GMM
BSIZE	0.464**	−1.107**	0.0222	−0.0569
	(0.224)	(0.518)	(0.334)	(0.101)
FEMALE	−0.0631	−0.0634	−0.0446	−0.117***
	(0.0756)	(0.122)	(0.0854)	(0.0212)
INDEP	−0.0551	−0.0449	−0.0370	0.00312
	(0.0382)	(0.0630)	(0.0445)	(0.00907)
DUAL	−3.822	18.36*	−0.668	−10.81***
	(3.654)	(10.88)	(4.863)	(0.494)
MEETINGS	−0.285	−0.274	−0.384	−0.758***
	(0.267)	(0.472)	(0.342)	(0.0386)
LNTA	2.351***	1.084	1.641***	0.968***
	(0.629)	(0.791)	(0.580)	(0.188)
EQTA	0.188**	0.0745	0.152*	−0.155***
	(0.0794)	(0.164)	(0.0899)	(0.0155)
NLTA	0.120**	0.156	0.152**	0.254***
	(0.0531)	(0.107)	(0.0648)	(0.0188)
COST	0.136**	0.126*	0.128***	0.0764***
	(0.0674)	(0.0730)	(0.0455)	(0.0205)
COR	−0.121***	−0.0458	−0.132**	−0.106***
	(0.0408)	(0.218)	(0.0575)	(0.0188)
LNGDP	−0.967***	12.87	−0.881*	1.122***
	(0.332)	(9.030)	(0.520)	(0.181)
CRISIS7_8	−3.850	−0.650	−2.132	−5.078***
	(4.451)	(3.558)	(3.208)	(0.182)
L.LLPNR				0.0341***
				(0.00291)
Constant	1.265	−71.15	10.01	1.987
	(7.131)	(61.39)	(7.572)	(2.142)
Observations	631	631	631	570
R-squared	0.099	0.052		

Notes: *LLPNR denotes loan loss provision/net interest revenue and it is the dependent variable, all other variables are covariates, BSIZE represents board size of the bank, INDEP denotes percentage of independent directors, DUAL represents role duality, FEMALE denotes the percentage of female directors on bank board, MEETINGS represents the number of board meetings per year LNTA denotes the size of the bank, COST denotes cost to income ratio, EQTA denotes equity/total asset, NLTA represents net loans/total assets, LNGDP represents Gross Domestic product, COR denotes corruption, CRISIS7_8 represents 2007/2008 financial crisis, ***, **, * indicate significance at 1, 5 and 10%, respectively, Robust standard errors in parenthesis*

impact of board independence on bank risk, measured by LLPNR may be caused by measurement error, extreme values and multicollinearity. The positive sign means that the presence of more independence directors increases bank risk in Africa. Independent directors are to provide a monitoring role, however, they may not have the knowledge, skills and experience to perform such function and therefore their presence may increase bank risk. Notably, this is not significant in the African context based on our findings. This finding is not in line with Rachdi et al. (2013), Lu and Boateng (2017) and Vallascas et al. (2017) who document significant positive relationship between board independence and bank risk.

Table 3. Results of bank risk and corporate governance using LLRGL as risk measure

MODEL	(1)	(2)	(3)	(4)
VARIABLES	OLS	Fixed effect	2SLS	GMM
BSIZE	−0.117**	−0.191**	−0.151**	−0.0784***
	(0.0460)	(0.0799)	(0.0624)	(0.0112)
FEMALE	0.00763	−0.0171	−0.00467	0.0131***
	(0.0130)	(0.0178)	(0.0151)	(0.00420)
INDEP	−0.0156*	−0.0241**	−0.0174**	−0.0126***
	(0.00903)	(0.00963)	(0.00808)	(0.00116)
DUAL	1.210	5.667***	1.672*	−0.166
	(0.965)	(1.752)	(0.986)	(0.145)
MEETINGS	0.0847	0.136*	0.0927	0.0555***
	(0.0549)	(0.0708)	(0.0607)	(0.00981)
LNTA	0.274*	0.169	0.231**	0.406***
	(0.147)	(0.116)	(0.0977)	(0.0164)
EQTA	0.0814***	0.0484*	0.0726***	0.00428*
	(0.0205)	(0.0269)	(0.0193)	(0.00231)
NLTA	−0.0560***	−0.101***	−0.0781***	−0.00634***
	(0.0131)	(0.0165)	(0.0124)	(0.00240)
COST	0.0218**	−0.00463	0.00323	0.0165***
	(0.0103)	(0.0103)	(0.00825)	(0.00238)
COR	−0.00609	−0.00102	0.000646	−0.00632**
	(0.00812)	(0.0348)	(0.0126)	(0.00299)
LNGDP	−0.0911	2.437*	−0.0717	0.0783***
	(0.0616)	(1.365)	(0.116)	(0.0182)
CRISIS7_8	−1.858**	−0.336	−0.745	−0.190***
	(0.836)	(0.559)	(0.536)	(0.0239)
L.LLRGL				0.730***
				(0.00967)
Constant	6.265***	−5.006	8.989***	−0.359*
	(1.149)	(9.235)	(1.521)	(0.188)
Observations	614	614	614	558
R-squared	0.184	0.157		

Notes*: LLRGL is the dependent variable, all other variables are covariates. LLRGL denotes loan loss reserve/gross loan, BSIZE represents board size of the bank, INDEP denotes percentage of independent directors, DUAL represents role duality, FEMALE denotes the percentage of female directors on bank board, MEETINGS represents the number of board meetings per year LNTA denotes the size of the bank, COST denotes cost to income ratio, EQTA denotes equity/total asset, NLTA represents net loans/total assets, LNGDP represents Gross Domestic product, COR denotes corruption, CRISIS7_8 represents 2007/2008 financial crisis, ***, **, * indicate significance at 1, 5 and 10%, respectively, Robust standard errors in parenthesis.*

Role duality (DUAL) has significant negative impact on bank risk measured by LLPNR (0.117***) but insignificant negative impact on bank risk measured by LLRGL (−0.166). The significant negative impact of duality on bank risk suggests that the same person holding CEO and chairman role at the same time is good for bank risk reduction in Africa. Splitting CEO and chairman roles to be handled by two different individuals is considered by the market as a good corporate governance practice. However, this does not reduce bank risk in Africa. Theoretically, the negative impact of duality on bank risk supports the stewardship theory which argues that CEO duality helps to make timely and best decisions within a firm due to the in-depth knowledge of the business already

gained by the CEO (Brickley et al., 1997; Syriopoulos and Tsatsaronis, 2012a). The finding supports the work of Akbar et al. (2017) who finds a significant negative relationship between duality and bank risk but contradicts the studies of Rachdi et al. (2013) and Lu and Boateng (2017) who report significant positive relationship between duality and bank risk.

The impact of board meetings (MEETINGS) on bank risk measured by LLPNR is significant and negative (−0.758***) suggesting that smaller number of board meetings increases bank risk in Africa. African banks may have many issues which require more attention and frequent meetings to resolve them. Therefore, smaller number of meetings may not be sufficient to resolve the issues of problem banks, therefore their risk will increase. Also, African banks may benefit from a proactive board which is associated with frequent meetings and monitoring, which is associated with lower bank risk. The negative impact of board meetings on bank is in line the agency theory (Jensen and Meckling, 1976), which states that frequent corporate board meetings is the increased capacity to advise effectively, discipline management and monitor them, which could reduce bank risk and improve financial performance. This finding is consistent with Battaglia and Gallo (2017) who record a significant negative relationship between the number of board meetings and bank risk.

Nonetheless, we observe a significant positive impact of board meetings on bank risk measured by LLRGL (0.0555***) indicating that frequent board meetings increase bank risk in Africa. Our findings also depict that agency cost associated with more board meetings including refreshments, sitting allowance and transport cost of board members is more than the benefits that more board meetings can bring to African banks. Also, African banks board members may be dominated by friends and family, and they may go for meetings to discuss more about their private life (such as issues relating to marriage and funerals) and little discussions on the main purpose of the board meeting. In such circumstance, more meetings will increase the risks of the banks instead of reducing them.

With specific regard to the impact of control variables on bank risk under GMM regression, we observed the following: Bank size measured by LNTA has significant positive relation with both LLPNR (0.968***) and LLRGL (0.406***). The findings indicate that the management of African banks are unable to manage bigger banks properly and as a result increase the risk of the banks. Also, because bigger banks have more customers who apply for loans, there is likelihood that many of the customers who borrow the loans in Africa will default the payment, and as a result increase the risk of the banks. The result is in line with the theoretical prediction that due to bureaucracy, bigger banks can have adverse effect when the banks grow extremely large which could increase risk (Athanasoglou et al., 2008). Our findings contradict the findings of Pathan (2009), Chan et al. (2016), and Berger et al. (2014) who find negative impact of bank size on risk.

Equity to asset ratio (EQTA) is significant and negatively related to LLPNR (−0.155***), which indicates that less capitalised banks in Africa are associated with higher bank risk. This result shows that in the event of high demand of capital or withdrawal of funds, the more funds available serve as a safety net for higher capitalised banks in Africa and for that matter reduce their risk. Theoretically, the result supports Daly and Frikha (2017) who show that well capitalised bank is the ability of the bank to honour its engagements to its clients based on its own resources, which could reduce its risk. The significant negative impact of equity to assets ratio on bank risk is consistent with the findings of Chan et al. (2016) and Minton et al. (2010) and contrary to Pathan (2009) who reports significant positive and insignificant impact of equity-to-assets ratio on bank risk, respectively. Contrarily, our result shows that equity-to-assets ratio is significant and positively related to LLRGL (0.00428*) indicating that larger capitalised banks in Africa are punished with high risk. The high capital banks in Africa may be tempted to grant more loans to different customers, and some of them have high probability of default making the banks prone to high default risk. If the banks have poor risk management techniques, they may not be able to save the banks from incurring high risk. This finding is consistent with the finding of Pathan (2009) and contrary to the findings of some prior literature (e.g., Chan et al., 2016; Minton

et al., 2010), which report a significant negative relationship between equity-to-asset ratio and bank risk.

The impact of net loans-to-asset ratio (NLTA) on bank risk, measured by LLPNR is significant and positive (0.254***), which implies that African banks lend more to their customers. More borrowing by customers makes the banks prone to high default risk as many of the borrowers may not be able to repay their loans. High net loans mean the banks will lose a lot of profit and spend more to manage the loans. The banks may not be in the position to embark on some vital operations and activities due to high loans with little profit, which may pose big danger to the banks and increase risk. Our result lends theoretical support to Sun et al. (2017) who posit that when the level of loans is high, it indicates that the traditional lending activities involved by the bank is high at the same time, operational cost is increased as a result of the bank subject to increasing level of default risk. Our result contradicts the findings of Dong et al. (2017) who reports insignificant effect of net loans to assets on bank risk. However, the result shows that net loans to assets have significant and negative impact on bank risk measured by LLRGL (−0.00634***). The result means that smaller level of net loans increase bank risk. This is because, although the level of net loans may be small, the loans offered may still not be managed probably due to poor risk management techniques used by the banks in Africa.

The impact of cost-to-income ratio (COST) on bank risk measured by both LLPNR (0.0764***) and LLRGL (0.0165***) is significant and positive implying that the total operational cost incurred by African banks exceeds their total generated income, and as a result, increases the risk of the banks. The result can also mean that the efficiency of management of the banks in Africa concerning expenses on banks performance is low, and for that matter exposes the banks to higher risk. Control of corruption (COR) has negative impact on bank risk measured by both LLPNR (−0.106***) and LLRGL (−0.00632**) indicating an increase in corruption. This finding shows that the high corrupt activities in Africa pose high threat to the activities of banks, which reduce their revenues and increase their risk. Therefore, an increase in corruption in Africa causes an increase in their bank risk.

The impact of GDP (LNGDP) on bank risk measured by both LLPNR (1.122***) and LLRGL (0.0783***) is positive, which may mean that during the period of cyclical upswings demand for loans and other bank services increases. The high demand for loans will increase the probability of default as a result of non-payment of some of the loans. In the situation where the banks in Africa have no proper credit risk management strategies in place, the risk of the banks will go high, hence the positive impact of GDP on bank risk in Africa. The findings support Shawtari (2018) who posits that a favourable condition in a country at any point in time causes people to borrow from banks to invest, and high borrowing could increase the banks default risk. The impact of financial crisis of 2007/2008 (CRISIS) on bank risk is significant and negative based on both risk measures, LLPNR (−5.078***) and LLRGL (−0.190***) depicting that the financial crisis hit developed countries more and had little impact on Africa banks; the crisis could not increase the risk of African banks. Also, it could mean that the African banks had more measures in place during the crisis period which effectively managed bank risk hence a reduction of their risk during the crisis period.

Using the ordinary least square model (OLS), fixed-effects and two-stage least squares (2SLS) models as robustness checks for the GMM findings, our tests suggest that the GMM results are robust, although we observe some sensitivities in the magnitude of the coefficient and significance levels. It should be noted that the inconsistence of some of the results of the main statistical model, GMM, with some of the results of OLS, fixed effect and 2SLS, may be partly due to the fact that GMM possesses a number of advantages including, resolving the problems of endogeneity, unobserved heterogeneity, autocorrelation and profit persistence, which the other techniques may not be able to resolve. Moreover, the inconsistence of the results depicted by LLPNR and LLRGL in the GMM model may be due to differences in a way in which LLPNR and LLRGL are measured. Different results can be expected since LLPNR and LLRGL are measured differently.

5. Conclusion and policy implication

This study investigates the dynamic relationship between corporate governance and bank risk in Africa using annual data of 635 banks from 48 countries in Africa. Our bank risk variables include loan loss provision to net interest revenue (LLPNR) and loan loss reserve to gross loan (LLRGL). The corporate governance variables are board size, female directors, role duality, board meetings and independent directors. Findings indicate that bank risk measured by LLPNR has significant negative association with female directors, CEO role duality and frequent board meetings. However, bank risk measured by LLRGL has significant negative connections with board size, board independent, but positive connections with female directors and board meetings in Africa. These findings are consistent with agency theory (Jensen and Meckling, 1976; Jensen, 1993), which argues that different corporate governance mechanisms such as board meetings, board size, female directors, role duality and the presence of independent directors may have impact on bank risk management which could increase bank performance.

This study is the first cross-country study that has captured corporate governance effects on bank risk in Africa. Our study contributes to the growing literature on corporate governance and bank risk and bridges the gap in the literature that is focused on only bank risk and performance in advanced economies. Regulators in Africa play a crucial role in providing confidence in their economies while protecting investors. Therefore, our study may guide them to come out with appropriate corporate governance codes that will assist banks to reduce bank risk and improve performance. Shareholders and management of banks may also make appropriate board appointments and apply best corporate governance practices to improve their performance while reducing risk at the same time. Our study suffers from some limitations which need mentioning. One, the study considered banks that have five or more years' information only. As a result, some banks were excluded from the final sample because they had less than five years' information at the time of data collection. In addition, our sample also do not include rural banks. Therefore, our empirical results do not represent the total banks in Africa. Future studies can add rural banks to their sample to see if their results will be different. Two, corporate governance information of some of the banks were not available. The reason is that the annual reports of some banks were either not found or not available at all. Future research can extend this study by considering all other banks in their sample by employing mixed methods approach to capture information from the banks that do not have annual reports by sending questionnaires through email to management of those banks.

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Notes

1. African banks were found on BankScope at the time of exporting the banks from the database. Some banks were repeated two or three times and some banks had less bank year information. Banks selected are those with five or more years information. The rest were not selected because they were considered not having enough information to be included in the final sample. Also, if the same bank is repeated more than one, only one is selected.
2. The reason is that, when the information of the banks was exported from BankScope database in December 2016, some banks did not have 2016 information at the time. Therefore, 2016–1019 information of those banks were later obtained from the Orbis bank focus, which is similar database which was replaced by Bereau van dijk when BankScope disappeared in December 2016.
3. info.worldbank.org/governance/wgi and data.worldbank.org/indicator.

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Appendix

Table A1. Summaries of measures and Variables

VARIABLE	MEASUREMENT
Panel A: Risk Variables (Response variable)	
LLPNR	Loan loss provisions divided by net interest revenue (%)
LLRGL	Loan loss reserve divided by gross loan (%)
Panel B: Corporate governance variables (Covariates)	
BSIZE	The number of directors on a bank's board per year
INDEP	Percentage of independent directors on bank board per year
DUAL	A binary number that equal to 1 if the CEO also take the role as chairman at the end of its financial year, or 0 if otherwise
FEMALE	Percentage of female directors on bank board per year
MEETINGS	The number of times that the board meets per year
Panel C: Control Variables	
LNTA	Natural log of total assets
COST	Overheads/net interest revenue plus other operating income (%)
EQTA	Equity divided by total assets (%)
NLTA	Net loans divided by total assets (%)
LNGDP	Annual GDP growth rate
COR	Rank of corruption perception from World bank (corruption perception index)
CRISIS	Dummy variable for 2007/2008 financial crisis

Notes: *LLPNR denotes loan loss provision/net interest revenue, LLRGL represents loan loss reserve/gross loan, BSIZE represents board size of the bank, INDEP denotes percentage of independent directors, DUAL represents role duality, FEMALE denotes the percentage of female directors on bank board, MEETINGS represents the number of board meetings per year, LNTA denotes the size of the bank, COST denotes cost to income ratio, EQTA denotes equity/total asset, NLTA represents net loans/total assets, LNGDP represents Gross Domestic product, COR denotes corruption, CRISIS represents 2007/2008 financial crisis.*

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