

RISK GOVERNANCE AND RISK-TAKING BEHAVIOR OF BANKS IN EMERGING MARKETS

Tafirei Mashamba^{*}, Shenaaz Gani^{**}

^{*} Corresponding author, University of South Africa, Pretoria, South Africa; Great Zimbabwe University, Masvingo, Zimbabwe
Contact details: Great Zimbabwe University, Off Old Great Zimbabwe Road, Morningside, P. O. Box 1235, Masvingo, Zimbabwe

^{**} College of Accounting Sciences, University of South Africa, Pretoria, South Africa



Abstract

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The study examines how risk governance mechanisms affect the risk activities of banks in emerging markets, Africa in particular. The sample comprised of forty-one banks in twelve African economies. Consistent with Akbar, Kharabsheh, Poletti-Hughes, and Shah (2017), Battaglia and Gallo (2017), and Sila, Gonzalez, and Hagendorff (2016), system GMM which controls for reverse causality and endogeneity was used for analysis. Surprisingly, the study found that the presence of a standalone risk committee, training in risk management and/or related courses, and the appointment of the chief risk officer (CRO) to the board increases instead of decreasing bank risk. Qualifications and experience in risk management or finance and the establishment of a CRO position were found to have an insignificant impact on risk outcomes. Intuitively, the study found that the appointment of females on bank boards results in risk-averse decisions and thus supports current calls for female representation on boards. A key takeaway from this paper is that establishing effective risk governance systems in emerging markets creates incentives for banks to take more risk, possibly, due to the fact that governance mechanisms that align the interests of managers and shareholders lead to higher bank risk (Felicio, Rodrigues, Grove, & Greiner, 2018). This counterintuitive behavior calls for the design of appropriate governance and regulatory mechanisms that curtail bank risk in the African context.

Keywords: Risk Governance, Risk-Taking Behavior, Banks, Africa, System GMM

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1. INTRODUCTION

Banking is all about taking risks. Banks deliberately take risks to serve their customers and clients and in turn generate profits to create value for shareholders (Otero, Alaraj, & Lado-Sestayo, 2020). Nevertheless, for risk-taking to maximize shareholder value, banks need appropriate risk management and governance structures, balanced incentives, and the right culture which all depends

on the corporate environment and the ability of banks to shape that environment (Stulz, 2014). Concomitantly, banks can quickly change their risk profiles due to the fragile nature of their balance sheets; hence, weak internal controls can swiftly trigger instability (United Nations, 2010). The need for properly designed processes for identifying, analyzing, and mitigating risks becomes paramount in banks to prevent debacles (Türsoy, 2018). Moreover, the risk-taking activities of banks

determine the safety and soundness of the financial system. Excessive risk behavior can trigger instability with negative externalities on depositors, creditors, deposit insurance schemes, and the real economy (Fernandes, Farinha, Martins, & Mateus, 2021). This makes risk governance processes related to risk-taking in banks pivotal. However, the governance of banks is more challenging compared to non-banks due to their special characteristics such as fragile balance sheets, complexity and opacity, and their central role in financial intermediation (Fernandes et al., 2021).

Similar to non-financial firms, risk management in a bank is the responsibility of the board of directors, herein the board. This duty requires, among other things, the board to establish the firm's risk governance framework, which encapsulates risk appetite, tolerance, and culture (Basel Committee on Banking Supervision, 2015). To effectively discharge its risk management and governance duties the board should be composed of members with risk management and financial knowledge and expertise (Ellul, 2015). This enables the board to comprehend the level of the entity's risk exposure and the long-run implications of their risk activities.

However, the responsibility of the banks' board of directors towards effective risk management came under severe criticism and scrutiny following the 2007/9 global financial turmoil. Scholars generally agree that bank boards were ineffective in their discharge of the risk management function in the period preceding the crisis (Blinco, Galbarz, Hohl, & Zamil, 2020; DeYoung, Peng, & Yan, 2013; Walker, 2009). Some of the observed governance flaws include the inability of boards to comprehend the level of risk executives were taking, inadequate knowledge and experience in risk management, and inadequate monitoring of bank executives' risk activities (Felicio et al., 2018; Mertzanis, 2011; Coyle, 2010; Kirkpatrick, 2009). Following the crisis, several governance reforms were instituted to control bank risk-taking incentives (Srivastav & Hagendorff, 2016). Some of the reforms include aligning executives' compensation to risk, representation of creditors on bank boards, the appointment of chief risk officers to boards, and recruitment of members with financial and risk management expertise on bank boards (Sánchez, Zamanillo, & Luna, 2020; Mongiardino & Plath, 2010).

Despite recent attention to banks' risk management and governance practices following the 2007/9 global financial crisis little is known about this subject in emerging markets, Africa in particular, since the issue of bank governance, later alone risk governance, is still evolving. Besides, the relevance and importance of corporate governance mechanisms vary between developed and emerging markets due to differences in regulatory, ownership, and corporate governance standards. For example, ownership dispersion in developed markets creates conflicts of interest and agency problems related to remuneration which affect risk-taking behavior whereas such challenges are marginal in emerging markets due to ownership concentration (United Nations, 2010). The United Nations (2010) adds that concentrated ownership characterized by family ownership that is prevalent in emerging markets usually breeds board professionalism challenges: lack of separation

between ownership and control, board representation, and management which affects firm governance.

Moreover, the African landscape suffers from several peculiarities that differ from developed economies: chiefly, a risky operating environment typified by macro-economic vulnerabilities that may affect boards' risk management function and risk-taking oversight. For instance, most macro-risks faced by African banks emanate from economic shocks like drought, wars, commodity price shocks, and natural disasters whereas macro-risks in developed economies generally arise from complex financial instruments and the close interconnectedness of the financial markets (Gottschalk, 2014). Gottschalk (2014) further notes that regulation in Africa tends to be micro-prudential and most African economies lack a macro-prudential framework largely due to a lack of resources and technical capacity to develop such a framework. Otero et al. (2020) reiterate that economies that delay applying prudential regulation are characterized by less cautious bankers. Besides, institutional quality, a reflection of corporate governance quality, is low in Africa compared to other regions (Epo & Nochi Faha, 2020).

This raises questions about African banks' boards' ability to control bank executives' risk-taking behavior which is necessary for systemic stability. In this respect, there is a gap in the literature regarding the interplay between risk governance and risk-taking behavior in economies with risky operating environments, weak regulation, and varying levels of corporate governance standards later alone economic and financial conditions. This piece of work attempts to cover this gap by analyzing the impact of a set of risk governance characteristics on risk outcomes using a cross-country sample of forty-one banks in Africa. Further, as far as could be ascertained, this is the first paper to empirically examine risk governance practices of banks operating in emerging markets which is limited in the literature. This analysis provides valuable insights into internal governance mechanisms in banks that affect risk-taking incentives. Such insights help to prevent excessive risk behavior and thereby stem instability and potential crisis. Hence, the paper offers regulatory and policy insights that contribute to bank governance reforms in emerging markets. The findings also allow comparisons against international benchmarks and best practices to identify strengths and weaknesses. Unlike previous studies on this discourse (Aljughaiman & Salama, 2019; Ellul & Yerramilli, 2013; Lingel & Sheedy, 2012; Pathan, 2009), this research is expanded by examining the impact of different interactions among different risk governance mechanisms on risk decisions of banks in emerging market economies. This offers rich insights into how governance mechanism interacts and affect bank risk in emerging markets.

This study also extends the literature on factors that affect the risk activities of banks across jurisdictions by conducting a cross-country analysis of the effects of risk governance attributes on bank risk. Such analysis reveals organizational factors that affect the application of international governance prescriptions in emerging markets.

The structure of the rest of the paper is as follows. Section 2 reviews the relevant literature. Section 3 analyses the methodology that has been used to conduct empirical research on the interplay between risk governance mechanisms and the risk-taking behavior of banks. Section 4 and Section 5 presents and discusses the empirical findings, and Section 6, the conclusion is drawn together with the research limitations, key policy issues arising from the study, and areas of further study.

2. LITERATURE REVIEW

2.1. Impact of risk governance on bank risk and testable hypotheses

To gain insights into the possible effects of risk governance on banks' risk-taking behavior the paper examines five aspects of the board's risk oversight function and how they are associated with risk-taking behavior. The study begins by investigating the impact of a standalone risk management committee on bank risk. Based on a study of non-banks, Bhuiyan, Cheema, and Man (2021) argue that establishing a standalone risk committee improves the quality of corporate governance in a firm which leads to lower risk-taking behavior. Their argument is based on the rationale of setting up the risk committee which is to oversee the risk management function of a firm and advise management on risks associated with a given project. Hence, the authors argue that firms with a standalone risk committee not only properly manage their risk but also avoid engaging in unnecessary high risky activities. Besides, standalone risk committees in banks are in line with current best practices; therefore, the study takes a standalone risk committee as a sign of strong risk governance and formulates the following hypothesis:

H1: Establishing a standalone risk committee positively affects bank's risk outcomes.

The study also examines the qualifications and experience of the risk management committee members. The variable of qualification and experience (*QualExp*) identifies whether at least one of the risk management committee members has a qualification or experience in the discipline of either Risk Management and/or Finance. Mongiarchino and Plath (2010) found that although nearly all large banks in the US had a risk committee before the crisis, the committees' effectiveness was limited by infrequent meetings and its composition: they lacked enough independent and financially knowledgeable members. In addition, the Organisation for Economic Co-operation and Development (OECD, 2014) argues that although a board may receive training on risk management such training(s) may not be enough to enhance risk governance. Hence, boards still need some members with qualifications and experience in risk management. Thus, the following hypothesis will be tested:

H2: Recruiting board members with experience and qualifications in risk management and/or finance mitigates excessive risk-taking behavior.

The third attribute on the boards' risk oversight function relates to the frequency of meetings of the risk management committee (*ActiveRisk_Com*). As highlighted by Mongiarchino

and Plath (2010) infrequent meetings of the risk committee were one of the key factors that compromised its effectiveness in the run-up to the 2007 financial crisis. Felicio et al. (2018) add that holding fewer meetings may limit the directors' ability to monitor managers' activities. Consistent with Mongiarchino and Plath (2010), Battaglia and Gallo (2017) found that banks with fewer board meetings per annum contributed significantly to the 2007 crisis. As such, the study conjecture that holding frequent meetings creates awareness among directors of the managers' risk activities; therefore, frequent meetings are assumed to have a positive impact on risk oversight.

H3: An active risk committee has better oversight on bank risk.

The risk environment is ever-evolving in terms of risk types, scope, and severity; therefore, board members need to receive regular professional training and continuing education on risk and its management (Baret & Hida, 2017). Thus, training and capacity building in risk management can greatly enhance a board's risk management and oversight function. To that end, the study claims that banks that periodically conduct risk management and related subjects professional training are better equipped with the knowledge and skills needed to identify, evaluate and control risks confronting their firms. Based on this analysis, the fourth hypothesis is postulated as follows:

H4: Training board members in subjects related to risk management helps banks to monitor and control the risk activities of bank executives.

A burgeoning important characteristic in risk governance is the role of the chief risk officer (CRO) in risk management. The CRO is responsible for enterprise risk management (ERM). Bailey (2019) highlights the importance of the CRO role in ERM execution with the finding that CRO appointment is not just a "box-ticking exercise" to appease regulators and investors but this role is associated with quality ERM and firm value. Similarly, the Basel Committee on Banking Supervision (2015) Principle 6 on Corporate Governance Principles for banks suggests that a bank's risk management function should be under the direction of the CRO. In other words, the Basel Committee on Banking Supervision elevates the role of the CRO in risk governance. Aebi, Sabato, and Schmid (2012) concluded that the presence and reporting line of CRO matters to a bank's crisis performance. Since data on the reporting line of the CRO is difficult to obtain from publicly available information the study analyzes the importance of the CRO role (or similar position) to bank risk by examining whether a bank has a CRO and whether the CRO seats on the board and formulates the following hypotheses:

H5a: The presence of a CRO in an organization helps to mitigate excessive risk behavior.

H5b: The appointment of the CRO to the board minimizes excessive risk-taking behavior.

For novelty, this study is extended by examining the effects of the interaction between different risk governance mechanisms on bank risk-taking behavior. Accordingly, the joint impact of the following¹ variables will be explored: board independence and board size (*Board_Ind*Board_Size*),

¹ The study intended to examine several interactions but due to collinearity issues some of the desired interactions were dropped.

qualifications and experience and training (*QualExp*Training*), and active risk committee and CRO board (*ActiveRisk_Com*CRO_Board*).

The intuition behind the first joint term (*Board_Ind*Board_Size*), stems from the role of independent directors in mitigating agency conflicts between managers and shareholders by providing monitoring and advisory services (Battaglia & Gallo, 2017). Hence, an independent board is viewed as a mechanism to limit opportunistic behavior among managers (Fernandes et al., 2021). At the same time, literature has shown that a strong board is effective in monitoring a bank's risk exposure on behalf of shareholders (Pathan, 2009). Thus, the following hypothesis is proposed:

H6: An independent and small board is effective in controlling and monitoring management's risk activities.

Next, the study hypothesizes that training board members with risk and/or qualifications and experience do not add much value to organizations with regards to risk monitoring and control on the basis that such board members already have risk management skills. This view is consistent with Minton, Taillard, and Williamson's (2014) argument that financial experts have the knowledge and skills to understand the complexity and risks associated with financial transactions; hence, they are better able to identify non-profitable risks that can jeopardize the stability of a bank and can advise managers to avoid such risks. Thus, the study claims that training risk/financial experts has no positive effects on bank risk outcomes, and formulate the seventh hypothesis as follows:

H7: Providing training to board members with risk expertise does affect a bank's risk outcomes.

The other interaction term of interest in this study relates to one of the reforms recommended in response to the 2007/9 crisis to improve risk governance in banks that is creating a CRO position and separating the risk committee from the audit committee (Fernandes et al., 2021). The study, therefore, explores the joint impact of an active risk committee and CRO board appointment (*ActiveRisk_Com*CRO_Board*) on bank risk. The study conjecture that appointing a CRO to a board with an active risk committee positively affects risk governance in banks. The eighth hypothesis is thus proposed as follows:

H8: Appointing the CRO to a board with an active risk committee is associated with conservative risk policies.

2.2. Previous studies

Ellul and Yerramilli (2013) analyzed the organizational structure of the risk management function of bank holding companies (BHCs) in the US during the period 1995 to 2010 to examine if differences in tail risk exposures among the BHCs is determined by differences in their risk management functions. They found that BHCs that had stronger risk management functions before the crisis exhibited lower tail risk and concluded that a strong and independent risk management function can reduce bank risk and enhance shareholder value.

Lingel and Sheedy (2012) extended the work of Ellul and Yerramilli (2013) by taking an international perspective of the effects of risk governance on risk

outcomes. Their sample comprised sixty large international financial institutions from developed countries in North America, Europe, and Asia-Pacific. They identified the following variables to have a significant impact on risk outcomes: inclusion of the CRO among the top executives, the activity of the risk committee, and the presence of experienced bankers in the risk committee. Similar to Ellul and Yerramilli (2013) they confirmed that stronger governance curtails bank risk.

The importance of risk governance attributes, relative to standard corporate governance mechanisms, was also supported by Aebi et al. (2012) with the finding that the role of the CRO is important in explaining banks' performance especially when the CRO reports directly to the board rather than the CEO. An important point that can be drawn from their study is the finding that in the event of conflicting risk-taking interests between the CEO and CRO, reporting directly to the board can be an effective tool for curtailing excessive risk-taking in banks.

Using a sample of 212 BHCs in the US over the period 1997 to 2004, Pathan (2009) examined how strong boards, reflected by small board size, more independent directors, less restrictive shareholder rights, and CEO power affects bank risk-taking behavior. They found evidence to support the view that strong boards are effective in stemming excessive risk behavior. On a positive note, CEO power was found to have a negative effect on bank risk outcomes.

In their study of non-banking institutions, Subramaniam, McManus, and Zhang (2009) concluded that the presence of a standalone risk committee engenders high-quality internal monitoring and control which reduces risk-taking by corporate executives. Likewise, Bhuiyan et al. (2021) argue that firms with a standalone risk committee effectively manage their risk and avoid excessive risky activities compared to corporates with a joint risk and audit committee. To that end, Bhuiyan et al. (2021) advocate for the separation of the audit and risk committee into standalone committees since the audit function is limited in its scope with regards to risk management.

3. DATA AND VARIABLES

3.1. Data

The study is confined to the period 2011 to 2020 and is focused on using a cross-country sample of African commercial banks that are more involved in traditional financial intermediation. Therefore, other forms of banking institutions are omitted in this research. Due to the limited availability of general bank governance as well as risk management-specific data in banks' databases like Bureau Van Dijk, this study collected listed banks' annual reports from the AfricanFinancials website (<https://africanfinancials.com/>). The website provides annual reports, stock prices, and news for all listed entities in Africa. This data source was complemented by hand collecting missing reports from banks' websites. The target population consisted of 68 commercial banks operating in 12 African economies. Next, delisted, suspended, or banks under curatorship were excluded from

the study as well as banks with missing data for at least three consecutive years. This screening process resulted in a sample of 41 listed banks in 12 African economies as shown in Appendix, Table A.1.

The study chose listed banks because of enhanced disclosure. They are compelled to disclose more information to investors by regulatory agencies such as the securities commissions as well as the bank regulatory bodies. Turning to data cleaning, the traditional method of using descriptive statistics to identify outliers was used. The outliers were removed by deleting the extreme values from the dataset. This cleaning process also ensured the use of normally distributed data to avoid spurious regression.

3.2. Risk governance measurement

Since the risk governance aspects of banks are not directly observable and measurable the study measures the risk governance aspects of African banks using dummy variables. The risk governance attributes of interest are the risk committee establishment, qualifications and experience, active risk committee, training and capacity building programs, and the importance of the CRO. The variables are discussed in Section 2 above and their measurement is shown in Table 1 below.

Table 1. Measurement of risk governance indicators

<i>Variable</i>	<i>Measurement</i>	<i>Literature source</i>
Risk management committee (<i>Risk_Com</i>)	One for a bank with a distinct or standalone risk management committee and zero otherwise	Akbar et al. (2017), Ellul and Yerramilli (2013), Lingel and Sheedy (2012)
Qualification and experience (<i>QualExp</i>)	One when one of the board members has a qualification and experience in Risk Management and/or Finance and zero otherwise	Mongiarchino and Plath (2010), Minton et al. (2014)
Active risk committee (<i>ActiveRisk_Com</i>)	One when the risk management committee meets more frequently relative to the overall board and zero elsewhere	Bhuiyan et al. (2021), Felicio et al. (2018)
Training and capacity-building programs (<i>Training</i>)	One when a bank's board yearly training program includes a subject on risk management or a risk management-related subject, otherwise zero	Fernandes et al. (2021), Stulz (2014)
<i>CRO_Presence and CRO_Board</i>	Takes the value of one and zero otherwise in either case for a bank that has a CRO (<i>CRO_Presence</i>) and the CRO seats on the board (<i>CRO_Board</i>)	Aljughaiman and Salama (2019), Aebi et al. (2012)

Source: Authors' elaboration.

3.3. Bank risk measurement (*RWA_TA*)

Since there is not much activity in risky structured products and derivatives in Africa because such activities are found in very few African economies, similar to Nguyen, Hagendorff, and Eshraghi (2016) and Berger, Kick, and Schaeck (2014) the study uses the ratio of risk-weighted assets to total assets (*RWA_TA*) to measure bank risk-taking behavior. *RWA_TA* is an ex-ante bank risk-taking proxy that indicates a bank's investment in risky assets (loans) (Ashraf, Arshad, & Hu, 2016). Likewise, the allocation of bank assets between risky and safe assets is a key determinant of a bank's risk (Heid, Porath, & Stolz, 2004; Jacques & Nigro, 1997). In addition to this, investors use *RWA* to examine a bank's portfolio risk (Das & Sy, 2012). Furthermore, risk-weighted assets (*RWA*) is a standard measure of bank risk that is used in bank regulation and supervision by the Basel Committee on Banking Supervision (BCBS). However, this metric has some shortcomings. *RWA_TA* only captures credit risk and leaves out other risks, thus, it only measures one aspect of the true asset risk (Jokipii & Milne, 2011).

3.4. Control variables

3.4.1. Bank governance attributes

Ownership structure

The issue of ownership structure is one of the contentious issues in corporate governance. Good corporate governance calls for the separation of ownership and control, but this separation engenders agency problems due to the difficulties encountered by outsiders in monitoring corporate

executives. On the other hand, ownership of a large stake in a firm creates incentives for shareholders to actively monitor the behavior of managers (Shleifer & Vishny, 1997). To that end, Mutarindwa, Schäfer, and Stephen (2018) show that closely held banks in Africa are associated with poor governance compared to widely held ones. Accordingly, this study hypothesizes that banks with concentrated ownership are associated lower risk compared to banks with diverse ownership because the agency and free-rider problems tend to be prevalent in ownership dispersed than concentrated firms (Dong, Meng, Firth, & Hou, 2014; Garcia-Marco & Robler-Fernandez, 2008; Heremans, 2007). Likewise, ownership type can also have a bearing on a bank's governance and risk outcomes. Dong et al. (2014) document that state-owned banks are more prone to political interference, especially in emerging markets, relative to privately owned banks which can have a negative impact on their risk choices. The study follows Mutarindwa et al. (2018) and Berger, Imbierowicz, and Raunch (2016) in measuring bank ownership. First, ownership concentration is measured by a binary variable that takes the value of one of the largest shareholder controls at least 10% of the bank's total equity and zero otherwise. Next, government ownership² is estimated by a dichotomous variable which takes the value of one for a bank that is owned at least 10% by the government and zero otherwise. Lastly, foreign vis-a-vis domestic ownership which is often neglected in literature is considered in this study through a dummy variable that takes the value of one for a foreign-owned bank and zero for a domestically owned bank.

² Due to data availability this domestic or foreign ownership was the only ownership variable examined.

Board diversity (age and gender)

The effect of diversity on bank risk is gaining attention in academic circles as well as among governments and regulators. Literature generally agrees that risk-taking decreases with age since young executives tend to take more risks compared to older managers while women are considered to be more risk-averse in financial decision-making (Berger et al., 2014). Accordingly, the study hypothesizes that age and gender negatively affect a bank's risk activities. Age is measured by the average age of the board members while gender takes the value of one for a male and zero for a female board member.

Board independence

Another corporate governance attribute that affects bank risk is the level of board independence. In their study on the effects of board independence on risk-taking behavior of large banks in the US post the 2007/9 financial crisis, Vallascas, Mollah, and Keasey (2017) show that boards with a high proportion of independent directors are more conservative. The prudent behavior was noted through high capital ratios and reduction in portfolio risk after the financial crisis. Battaglia and Gallo (2017) highlight that independent directors provide better risk monitoring services than other directors because they desire to keep a good reputation. This study hypothesizes that board independence is associated with lower risk. This variable is measured by the proportion of non-executive independent directors to total directors. The higher the value the more independent a board is presumed.

Board size

Board size is one of the internal governance mechanisms that is widely explored in literature since it is an important mechanism that can mitigate agency problems between managers and shareholders. Although there is no consensus on the optimal number of directors, it is clear that board size influences a firm's decision-making process which in turn affects its risk choices. Nevertheless, evidence on the impact of this attribute on bank risk is mixed. One strand of literature argues that small boards are more effective in decision-making because they have fewer communication and coordination challenges (Fernandes et al., 2021). The other strand of literature contends that a large board provides a large pool of human capital that may provide better advisory services to management (Akbar et al., 2017). Nevertheless, the cost of more human capital may outweigh the benefits if one considers challenges associated with a large board such as communication, coordination, and "free rider" problems (Pathan, 2009). Besides, the decision-making process of a large board may be time-consuming and slow (Martín & Herrero, 2018). Moreover, large boards tend to have problems in reaching a consensus on important matters and this may lead to conservative risk-taking practices

(Akbar et al., 2017). Based on this discussion, it can be inferred that smaller boards are associated with high risk-taking behavior because less effort and costs are incurred to reach a consensus in smaller boards, therefore, riskier projects are highly likely to be approved.

3.4.2. Bank specific characteristics

Bank size

The too big to fail theory suggests that large banks have strong incentives to invest in risky projects because they can be bailed out by the governments in the event of financial distress to prevent systemic risk (Anginer, Demirgüç-Kunt, Huizinga, & Ma, 2018). In this regard, size creates incentives for bank managers to take more risks. The study predicts that size is associated with moral hazard problems that engender high-risk behavior. Consistent with literature the study measures size by the natural logarithm of total assets.

Capital

Higher capital requirements reduce a bank's profits due to higher provisions (Bitar, Pukthuanthong, & Walker, 2018) and this may tempt managers to increase the risk to remain profitable. Bouwman, Kim, and Shin (2018) and others concluded that highly capitalized banks engage in riskier lending. On the other hand, other scholars, for instance, Danisman and Demirel (2019) argue that capital reduces moral hazard and creates incentives for stricter monitoring, resulting in lower bank risk. Thus, the effect of capital on bank risk is not clear and subject to further investigation. In this study, bank capital is measured by a bank's regulatory capital adequacy ratio (i.e., Tier 1 + Tier 2 scaled by risk-weighted assets).

Business model

The impact of income structure, a proxy for the business model, on bank risk has drawn attention in recent years due to the growing trend towards non-interest revenue sources as banks seek to stabilize their income streams. However, the effect of income diversification on bank risk is ambiguous because non-funded income can be volatile in times of crisis (Altunbas, Manganelli, & Marques-Ibanez, 2017). Following Beltratti and Stulz (2012) who used the ratio of non-interest income to total income to measure income diversity, this study uses this metric to analyze the effects of the business model on bank risk.

4. ECONOMETRIC MODEL AND ESTIMATION APPROACH

Based on the variables described above, the following empirical model is used to examine the interplay between a bank's risk governance function and its asset risk outcomes.

$$Risk_{i,t} = \alpha_{it} + \lambda Risk_{i,t-1} + \beta_k Risk_{gov_{i,t}} + \gamma_k Bank_{gov_{i,t}} + \varphi_k Bank_{i,t} + v_{i,t} + \delta_{it} + \tau_{it} \quad (1)$$

where, subscripts i, c, t represent a bank, a country, and a year, respectively. $Risk$ is the measure of bank risk, $Risk_{gov}$ is a set of risk governance indicators, namely oversight, qualifications and experience, risk committee activeness, training, and CRO importance. $Bank_{gov}$ and $Bank$ are set of control variables. $Bank_{gov}$ controls for bank governance characteristics that may affect banks' asset risk choices, i.e., ownership structure, and board

diversity; $Bank$ is bank-specific control variables that may influence bank executives' risk choices, namely size, business model, and capital. $v_{i,c,t}$ refers to bank fixed effects while δ_{it} is the idiosyncratic error term. λ is the speed of adjustment while $risk_{i,c,t-1}$ is the lagged dependent variable. τ_{it} are time effects.

The complete model considering all the variables is specified as follows:

$$Risk_{i,c,t} = \alpha_{it} + \lambda Risk_{i,c,t-1} + \beta_1 Risk_Com_{i,c,t} + \beta_2 QualExp_{i,c,t} + \beta_3 ActiveRisk_Com_{i,c,t} + \beta_4 Training_{i,c,t} + \beta_5 CRO_Presence_{i,c,t} + \beta_6 CRO_Board_{i,c,t} + \gamma_1 Dom_Foreign_{i,c,t} + \gamma_2 Gender_{i,c,t} + \gamma_3 Board_Ind_{i,c,t} + \gamma_4 Board_Size_{i,c,t} + \phi_1 Bank_Size_{i,c,t} + \phi_2 CAR_{i,c,t} + \phi_3 Business_Model_{i,c,t} + v_{i,c,t} + \delta_{it} + \tau_{it} \quad (2)$$

The research is expanded by examining the joint impact of different risk governance indicators on bank risk outcomes; namely interactions between board independence and board size ($Board_Ind * Board_Size$), qualifications and experience and training ($QualExp * Training$), and active risk committee and CRO board appointment ($ActiveRisk_Com * CRO_Board$). The first interacting term sought to understand the joint impact of board

independence and board size on risk decisions. The second product examined the effects of providing training to board members who are qualified and experienced in risk management and finance on bank risk outcomes while the last interacting term investigated the impact of appointing the CRO to the board given an active risk committee. The extended model with all the variables is specified as follows:

$$Risk_{i,c,t} = \alpha_{it} + \lambda Risk_{i,c,t-1} + \beta_1 Risk_Com_{i,c,t} + \beta_2 QualExp_{i,c,t} + \beta_3 ActiveRisk_Com_{i,c,t} + \beta_4 Training_{i,c,t} + \beta_5 CRO_Presence_{i,c,t} + \beta_6 CRO_Board_{i,c,t} + \gamma_1 Dom_Foreign_{i,c,t} + \gamma_2 Gender_{i,c,t} + \gamma_3 Board_Ind_{i,c,t} + \gamma_4 Board_Size_{i,c,t} + \phi_1 Bank_Size_{i,c,t} + \phi_2 CAR_{i,c,t} + \phi_3 Business_Model_{i,c,t} + \xi_1 Board_Ind * BoardSize_{i,c,t} + \xi_2 QualExp * Training_{i,c,t} + \xi_3 ActiveRisk_Com * CRO_Board_{i,c,t} + v_{i,c,t} + \delta_{it} + \tau_{it} \quad (3)$$

Estimating a causal relationship between risk governance and bank risk is challenging because board characteristics are endogenously chosen by corporates and corporate governance variables tend to suffer from reverse causality (Fernandes et al., 2021; Vallascas et al., 2017; Chang & Zhang, 2015). An econometric specification that controls endogeneity and reverses causality is thus needed to estimate the empirical model. Different estimation techniques that control endogeneity and reverse causality have been offered in the literature for example simultaneous equations modeling (using either the 2-stage least squares or 3-stage least squares). These estimation techniques were employed by Fernandes et al. (2021), Bhuiyan et al. (2020) among others. Some scholars such as Gomez-Escalonilla and Parte (2017), Battaglia and Gallo (2017), and Sila et al. (2016) applied instrument variable approaches, GMM modeling to be precise. There are two GMM estimation techniques; namely difference GMM (Arellano & Bond, 1991) and system GMM (Blundell & Bond 1998; Arellano & Bover, 1995).

Following Akbar et al. (2017), Battaglia and Gallo (2017), and Sila et al. (2016), the study resorts to GMM estimation, two-step system GMM in particular since the empirical specification is dynamic. Besides, GMM controls reverse causality and the effects of unobserved fixed effects (Sila et al., 2016). Moreover, system GMM is more efficient to difference GMM because it uses more moment conditions (instruments) (Blundell & Bond, 1998). It corrects endogeneity by transforming the instruments using orthogonal deviations to make them uncorrelated (exogenous) with the fixed effects and this also minimizes data loss in unbalanced panels such as in this study (Blundell & Bond, 1998). Further, as highlighted by Blundell and

Bond (1998), system GMM is more efficient to difference GMM when the dependent variable exhibits a random walk, i.e., persistent. Nevertheless, Arellano and Bond's (1991) difference GMM will be used for the robustness test.

5. RESEARCH FINDINGS

5.1. Descriptive statistics

The descriptive statistics that describe or summarize the features of the risk governance and the control variables used in the study are displayed in Table 2.

From the results in Table 2, it can be noted that risk-weighted assets scaled by total assets of banks used in the study averaged 0.61 between 2009 and 2020, showing that banks used in the study invested about 60% of their assets in risky assets (mostly loans). This value is relatively high and suggests that banks in Africa have to hold large capital buffers to mitigate insolvency risk arising from unexpected losses. Nonetheless, the skewness and kurtosis values for this variable (0.01 and 2.62, respectively), suggests that this variable is normally distributed when one considers the generally acceptable levels of -3 to 3 for skewness and -7 to 7 for kurtosis (Hair, Back, Babin, & Anderson, 2010). The results also show that most of the sampled banks (mean = 87%) have a standalone risk committee consistent with best practices. The negative skewness value (-2.44) authenticates these results. However, most of the risk committees of the sampled banks are not active as evidenced by the average value of 0.32. This is confirmed by the skewness of 0.77.

Table 2. Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max	Skewness	Kurtosis
RWA_TA	429	0.61	0.1223	0.27	0.89	0.01	2.62
Risk_Com	477	0.87	0.3172	0	1	-2.44	6.96
QualExp	477	0.41	0.4929	0	1	0.35	1.12
ActiveRisk_Com	475	0.32	0.4670	0	1	0.77	1.6
Training	476	0.32	0.4675	0	1	0.76	1.58
CRO_Presence	477	0.78	0.4148	0	1	-1.35	2.83
CRO_Board	477	0.14	0.3478	0	1	2.07	5.28
Dom_Foreign	477	0.42	0.4936	0	1	0.34	1.11
Gender	402	0.22	0.1129	0	1	0.65	4.43
Board_Ind	318	0.47	0.2394	0	1	-0.26	1.81
Board_Size	428	10.71	3.2969	4	21	0.71	3.15
Bank_Size	470	16.74	3.1318	9.75	23.6	0.19	1.92
CAR	435	0.18	3.6786	0.10	0.26	-0.07	3.00
Business_Model	459	0.36	0.1525	0.12	0.79	0.61	2.82

Source: Authors' computation based on the research data.

The descriptive statistics also indicate that board training in risk and related topics among sampled banks is quite low (mean = 0.32; standard deviation = 0.47). The skewness and kurtosis values of 0.76 and 1.58 confirm these findings. This finding could be attributed to limited disclosure on boards' training activities in the given period. Moreover, most of the banks used in the study have a CRO or related title in place (average = 0.78, skewness = 1.35), but unfortunately, most of the CROs do not seat on the board (mean = 0.14, kurtosis = 5.28) contrary to current best practices. In worst cases, some of the banks³ did not even have the head or CRO among the executive committee. In some banks, the CRO seldomly attends the risk committee meetings by invitation.

Female representation averaged 2 per 10 board members, and some of the sampled banks did not have even one lady on their boards. The kurtosis of 4.43 shows a leptokurtic distribution of women's representation on boards. This means women's representation on bank boards is still a long journey in Africa consistent with current calls for increased female representation on corporate boards. The minimum and maximum values of 4 and 21, respectively, and a standard deviation of 3.3 for board size indicate huge disparities in the number of board directors among banks in Africa. These findings show that one of the sampled banks had only 4 directors while the largest board comprised of 21 members. The kurtosis of 3.15 confirms huge disparities of board sizes in emerging markets. Nevertheless, the average board size of 10.71 is comparable to developed economies. For example, Aebi et al. (2012) found a mean board size of 12.89. Bank size, measured by the natural logarithm of total assets, has a minimum value of 9.75 and a maximum value of 23.6, showing that both large and small banks are represented in the study.

The average capital adequacy ratio of 0.18 (18%) indicates that banks used in the sample are adequately capitalized when one considers Basel II minimum capital adequacy ratio of 12.5%. However, the dispersion is low (standard deviation = 0.0396) showing that the capital ratios of sampled banks do not differ significantly. This is supported by a kurtosis value of 3 and skewness that is close to zero, suggesting a normal distribution. The business model, which shows the extent to which the banks' income is driven from non-funded sources, averaged 0.36 over the period from 2009 to 2020, meaning about 40% of the banks' revenue was generated

from fees, commissions, and other non-interest income activities. This shows marginal income diversification and greater dependence on traditional lending activities among the banks. All in all, the skewness and kurtosis values are within the acceptable levels, suggesting that the data is normally distributed.

5.2. Unit root results

The results of the Fisher-type stationarity test conducted to check for the presence of unit roots in the variables are presented in Table 3.

Table 3. Unit root test results

Variable	Order of integration	Significance level
RWA_TA	I(0)	1%
Gender	I(0)	1%
Board_Size	I(0)	1%
Bank_Size	I(0)	1%
CAR	I(0)	1%
Business_Model	I(0)	1%

Source: Author's computation based on the research data.

The unit root test results displayed in Table 3 show that all the variables are stationary at a 1% level; hence, unit roots are not an issue in this study.

5.3. Correlation matrix

The study used a correlation matrix to check for multicollinearity, and the correlation matrix is displayed in Appendix, Table A.2. The results in Table A.2 (see Appendix) show that no variables had a correlation above 0.70, and as such, the research variables are free from multicollinearity. On the other hand, four variables show a significant correlation with the dependent variable (*RWA_TA*), namely *ActiveRisk_Com*, *CRO_Board*, *Dom_Foreign*, and *Business_Model*. *ActiveRisk_Com* is negatively related to banks' risk-taking behavior, implying that banks with active risk committees take low risk consistent with (Lingel & Sheedy, 2012). On the contrary, the results show a positive impact of CRO presence on bank risk suggesting that banks that have CROs on their boards engage more in risk activities⁴. The positive correlation between *Business_Model* and bank risk suggests that banks with diversified income sources engage in more risky activities, and this behavior is reasonable.

³ Results are not presented.

⁴ This finding will be verified through regression analysis since correlation does not imply causation.

5.4. Empirical findings and discussion of results

The objective of this study was to examine the interplay between risk governance characteristics and the risk behavior of banks in Africa. The empirical results are presented in Table 4 and three models were used for analysis. The baseline empirical model (equation (2)) findings

are displayed in column 2, Table 4. The model extension results are shown in column 3, Table 4. Lastly, a parsimonious version of the empirical model (that excludes control variables) was estimated and the results are presented in column 4, Table 4. Time effects were also added to the parsimonious model and the results are presented in column 5, Table 4.

Table 4. Empirical results

Variable	Coefficients			
	Model (1)	Model (2)	Model (3)	Model (4)
1	2	3	4	5
<i>RWA_TA (1)</i>	0.6508***	0.6862*	0.8477***	0.8441***
<i>Risk_Com</i>	1.1753***	-0.8848**	-0.3519	-0.1763
<i>QualExp</i>	-0.2456	0.8567*	-0.7897***	-0.3332
<i>ActiveRisk_Com</i>	-0.1739*	-0.0725	0.2316**	0.0069
<i>Training</i>	0.3184**	0.4079*	-0.3178*	0.3856***
<i>CRO_Presence</i>	-0.2654	0.3992	0.9702***	0.8768**
<i>CRO_Board</i>	1.1232***	1.2643***	0.2418**	0.6698***
<i>Dom_Foreign</i>	1.8673***	1.1271**	-	-
<i>Gender</i>	-2.5346***	-0.2233	-	-
<i>Board_Ind</i>	2.4682***	0.7765*	-	-
<i>Board_Size</i>	-0.0565*	0.0474	-	-
<i>Bank_Size</i>	-0.1573***	-0.113**	-	-
<i>CAR</i>	-0.1100***	-0.089***	-	-
<i>Business_Model</i>	0.3050***	0.3169***	-	-
<i>Board_Ind*Board_Size</i>	-	-0.1208*	-0.0964***	-0.121***
<i>QualExp*Training</i>	-	-0.1413	0.7671***	0.5172**
<i>ActiveRisk_Com*CRO_Board</i>	-	-1.1284**	-0.5591***	-0.4835
Time effects	Yes	Yes	No	Yes
Test statistics				
Sargan	0.3388	0.7218	0.4685	0.5665
AR (1)	0.2653	0.2751	0.2454	0.2468
AR (2)	0.2816	0.2918	0.2635	0.3035

Notes: *, **, *** denotes significance at 10%, 5%, 1% in that order.

Source: Authors' computation.

5.4.1. Baseline empirical model

The results show in column 2, Table 4 show that the instruments used are properly identified (Sargan test, $p > 5\%$) and autocorrelation in the second difference is absent in the research model since both AR (1) and AR (2) statistics are above 5% significance level. Moreover, the coefficient of the lagged dependent variable is both positive and statistically significant which validates the adoption of system GMM for analysis.

Risk governance variables results

The research findings for the risk governance variables are mixed. As shown in column 2, Table 4 the point estimate for the variable *Risk_Com* is positive ($\beta_1 = 1.18$) and it is statistically significant at a 1% level, meaning a bank with a standalone risk committee takes more risk, in terms of risk-weighted assets, all else equal. Accordingly, *H1* cannot be supported. These results are counterintuitive and two possible explanations can be provided for such results. First, as documented by Akbar et al. (2017), the risk committee provides an important oversight role related to the risk-taking activities of managers which reduce conflicts of interest between managers and shareholders. Consequently, managers are expected to act in the interests of shareholders. However, the alignment of interests between managers and shareholders cause managers to be less conservative and take more risk to increase shareholder wealth. This viewpoint is supported by Berger et al. (2016) who showed that

bank risk increases when the incentives of shareholders and managers are aligned. Secondly, since the risk committee is usually composed of risk experts with a better understanding of risk and its mitigation, the members can use their expertise from a strategic perspective to encourage managers to take good risks, i.e., risks that are ex-ante rewarding which in turn increases bank risk. This analysis corroborates Stulz's (2014) argument that bank managers should not avoid high-risk valuable investments and activities as such action can be costly for shareholders.

Next, although the coefficient of *QualExp* has the expected negative sign ($\beta_2 = -0.25$) but it is statistically insignificant. Thus, the study did not find evidence to support hypothesis two and the view that the presence of board members with qualifications and experience in risk management and/or finance reduce risk in African banks. The insignificant impact of qualifications and experience on bank risk implies that choosing board members based on their credentials may not be adequate in curtailing bank risk (Marques & Oppers, 2014; OECD, 2014). We cast doubt on the effectiveness of recruiting risk or finance experts concerning reducing risk-taking incentives of managers and suggest that nomination committees and shareholders should go beyond credentials and consider other critical factors such as the abilities of a board member to effectively challenge management decisions.

As expected, *ActiveRisk_Com* has a negative ($\beta_3 = -0.17$) and statistically significant point estimate at a 0.10 level. The results support *H3*

which predicted that frequent meeting of the risk committee plays a significant role in monitoring and controlling the risk activities of executives. This evidence is intuitive and resonates with earlier studies from developed markets (Battaglia & Gallo, 2017; Lingel & Sheedy, 2012). The results show that the more frequent a board meets the more aware they are of the corporate's activities (Felício et al., 2018), the more effective their risk oversight function.

Another surprising finding is the positive impact of training on bank risk ($\beta_4 = 0.32$; $p < 0.05$). This is inconsistent with Basel Committee on Banking Supervision's (2015) view that providing board members with more training in risk management and related topics helps banks to reduce risk. Accordingly, $H4$ is refuted. These results imply that training board members in risk and related topics engender more risk-taking behavior. A reasonable explanation for this evidence could be that providing board members with professional training and continuous development in risk creates a high level of risk awareness and at the same time improves the board members' risk management and oversight skills. This, in turn, entices the board to encourage managers to take high-risk activities to maximize shareholder value on the backdrop that they understand the complexity and risks inherent in projects and can monitor and control the bank's risk profile.

The last risk governance examined in this study is the role of the CRO in risk governance. Two indicators were used for this analysis; namely the presence of a CRO within a bank (*CRO_Presence*) and whether the CRO seats on the board (*CRO_Board*). The variable *CRO_Presence* has a negative ($\beta_5 = -0.27$) but the insignificant association with *RWA_TA*, meaning statistically study could not find evidence to support $H5a$. This evidence is suggesting that, although having a CRO post in a bank lowers risk (negative sign), the impact of this position in reducing bank risk is insignificant. It seems the extent of autonomy and power given to the CRO in emerging markets is not adequate to provide effective risk oversight. Our results convey that banks in emerging markets should create a "powerful" CRO position if they are to realize positive results from this position concerning risk oversight. The study also found a positive significant impact of CRO board membership, contradicting the argument that CRO appointment to the board lowers bank risk (Aebi et al., 2012). The coefficient for *CRO_Board* is positive and quite high ($\beta_6 = 1.12$) and it is significant at a 0.01 level. The hypothesis that appointing the CRO to the board positively impacts (reduce) bank risk ($H5b$) is, therefore, not supported. This evidence supports Felício et al.'s (2018) conclusion that governance mechanisms that improve risk governance and align the interests of managers and shareholders create incentives for higher bank risk.

Corporate governance characteristics findings

The results in column 2, Table 4 show that ownership structure, measured by domestic or foreign ownership, has a positive effect on bank risk ($\gamma_1 = 1.87$; $p < 0.05$). This evidence confirms the view that domestic banks pursue aggressive risk policies

compared to foreign banks (Mateos De Cabo, Gimeno, & Nieto, 2012). Chen et al. (2019) document that domestic banks take more risk in response to competition induced by the entry of foreign banks.

Turning to the effects of gender on bank risk, the study identified a significant negative point estimate of -2.53 that is statistically significant at 0.01. Unlike Berger et al. (2014) and Adams and Funk (2012) who concluded that females are risk-loving like males and their presence on boards does not result in more risk-aversion decisions, this study found that increasing female representation on bank boards reduces bank risk. This evidence corroborates with Mateos De Cabo et al. (2012) who found that gender diversity in Europe is prevalent in banks with a risk-aversion mantra consistent with the view that female executives are more risk-averse than men. These results suggest that gender diversity enhances risk governance and therefore supports ongoing requests from pressure groups for more women representation on boards.

The study identified sufficient evidence of a positive impact of board independence on bank risk ($\gamma_1 = 2.47$; $p < 0.05$). The positive and statistically significant of the coefficient *Board_Ind* suggest that banks with a large proportion of independent directors are willing to take more risk. This is contrary to the assertion that independent directors are conservative because they have to balance the interests of all stakeholders including creditors and taxpayers by being more accurate and stringent in their risk oversight (Vallascas et al., 2017). However, these results seem to be supporting the argument that internal governance mechanisms that align the interests of managers and shareholders create incentives for higher bank risk as managers take more risk to create wealth for shareholders.

The variable *Board_Size* enters the regression equation with a negative and statistically significant coefficient ($\gamma_4 = -0.06$; $p < 5\%$). Consistent with results from developed economies (Minton et al., 2014; Pathan, 2009), the study found that small boards are associated with high bank risk. This evidence concurs with Fernandes et al.'s (2021) argument that small boards tend to encourage and approve riskier projects which leads to higher risk as they face less effort and cost to reach consensus. On the other hand, these results show that large boards in Africa are associated with lower risk, thereby confirming the notion that large boards are effective in monitoring and controlling the risk activities of bank managers (Battaglia & Gallo, 2017). Battaglia and Gallo (2017) show that large boards can assign more people to supervise and advise managers which in turn reduces managers' discretionary power or makes it easier to identify opportunistic behavior among managers. Accordingly, the study found evidence to support the group decision-making doctrine, which documents that large groups tend to be more cautious and exploit a large pool of human capital to provide constructive advice to managers.

Bank specific factors results

Concerning the impact of bank-specific factors on bank risk, bank size has a negative and significant impact on bank risk ($\varphi_1 = -0.16$; $p < 0.05$) contrary to the too big to fail hypothesis which suggests that

large banks assume more risk due to their possibility of a government bailout. These results suggest that large banks in Africa pursue conservative lending policies. Likewise, bank capital has a significant negative effect on risk outcomes ($\varphi_2 = -0.11$; $p < 0.05$). The evidence suggests that large banks in emerging economies are associated with lower risk consistent with Allen, Carletti, and Marquez (2011) who found that capital reduces moral hazard and creates incentives for stricter monitoring, resulting in lower bank risk. Lastly, the business model plays a significant role in shaping emerging markets banks' risk outcomes as shown by the positive coefficient sign of the variable *Business_Model* ($\varphi_3 = 0.31$; $p < 0.05$). The evidence is intuitive since banks that generate more income from non-core banking activities assume more risk (Knaup & Wagner, 2012).

5.4.2. Model extension

The baseline model was extended to get insights into the joint impact of different risk governance attributes on bank risk behavior. The results of this exercise are displayed in column 3, Table 4. First, the results show that an independent and strong board (small board) pursues a conservative risk policy since the point estimate of (*Board_Ind*Board_Size*) is negative and significant, confirming *H6*. This finding is intuitive given that a board with a high proportion of independent directors is less likely to engage in risky activities for reputation's sake (Bhuiyan et al., 2021; Pathan, 2009). Similarly, Pathan (2009) documents that a strong board (small board) is effective in restraining risk activities of bank executives. The variable *QualExp*Training* enters the regression model with the expected negative but insignificant sign, thereby suggesting that training board members with experience and qualifications in risk management and/or finance does not result in reduced risk-taking. Thus, the study found evidence to support *H7*. These results show that training board members with risk expertise in risk management or related subjects do not add much value to banks with regards to risk outcomes as these people already have the knowledge and skills to manage and monitor risk. Lastly, the positive and significant coefficient on the variable *ActiveRisk_Com*CRO_Board*, suggests that appointing the CRO to a board with an active risk committee, that is a risk committee that meets frequently, has a significant positive impact on bank risk outcome all else equal. Accordingly, *H8* is confirmed. This evidence buttresses CRO board appointments and frequent meetings of the risk committee in emerging market economies.

The risk governance and control variables results are mixed; some are consistent with earlier findings while some depart from the baseline model findings. For example, the risk committee enters the extended model with a negative and statistically significant point estimate, showing that the establishment of a standalone risk committee lowers a bank's risk profile. This evidence is intuitive and corroborates with literature and renders support to governance reforms that seek to separate the risk committee and the audit

committee. Another divergent finding is the positive and significant impact of the variable *QualExp* on bank risk. The baseline model showed a negative and insignificant effect of qualifications and experience on the level of risk-weighted assets scaled by total assets, meaning that, although this attribute lowers bank risk, its impact is insignificant. However, the extended model has contradicting results; a bank with board members who are experienced and qualified in risk management and/or finance takes more risk. This evidence confirms the principal argument that mechanisms that align the interests of managers and shareholders increase rather than decrease bank risk.

Nevertheless, most of the earlier findings hold in terms of statistical significance although coefficient signs may differ. For instance, *CRO_Presence* had a negative and insignificant point estimate in the baseline model but has a positive and insignificant effect on bank risk in the extended model. The same applies to the variable *gender*. Board size had a negative and significant impact on risk in the empirical model but has a positive and insignificant effect on risk in the extended model, suggesting that board size is not a determinant of bank risk in emerging markets. This evidence points to coordination challenges associated with large boards in decision-making (Akbar et al., 2017).

5.4.3. Robustness tests

The study adopted alternative specifications and added the square of board size to ensure that the empirical results are robust. Difference GMM, an alternative to system GMM, and pooled OLS were used as the alternative specifications. The difference GMM estimator proposed by Arellano and Bond (1991) corrects endogeneity by transforming all regressors through differencing but its weakness is that, as indicated earlier, it removes previous observations from the contemporaneous one which magnified gaps in an unbalanced panel. Pooled OLS, a simple OLS estimator for panel data, was also used as an alternative estimating technique. This estimator was used in extant literature (Zhang, Li, Xu, & Ortiz, 2021; Battaglia & Gallo, 2017). Table 5 below presents the robustness test findings⁵. For easier comparison, the baseline model results are re-displayed in column 5, Table 5.

The results of estimating the empirical model (equation (2)) with the difference GMM estimator presented in column 2, Table 5 show that most of the baseline risk governance findings hold. For instance, the variables *Risk_Com*, *Training*, *CRO_Presence* have similar coefficient signs and impact as in the baseline regression model output. *ActiveRisk_Com* is the only variable that departs significantly from the baseline results. The output of difference GMM estimation shows that banks in emerging markets with active risk committees take more risk contrary to extant literature (Battaglia & Gallo, 2017; Lingel & Sheedy, 2012). These results could be supporting the earlier argument that mechanisms that align the interests of executives and shareholders engender higher risk behavior to maximize shareholder wealth.

⁵ The analysis is limited to risk governance measures and their interactions to save space.

Table 5. Robustness test results

Variable	Difference GMM (1)	Pooled OLS (2)	Model with size squared (3)	Baseline model (4)
1	2	3	4	5
<i>RWA_TA (1)</i>	0.6469***	-	0.6334***	0.6508***
<i>Risk_Com</i>	2.612***	1.4186***	4.3209***	1.1753***
<i>QualExp</i>	1.35***	-0.9319***	0.705	-0.2456
<i>ActiveRisk_Com</i>	0.0266	-0.2695	-0.0713	-0.1739*
<i>Training</i>	0.4277*	-0.3008	0.4063	0.3184**
<i>CRO_Presence</i>	-0.5289	0.3286	-0.2564	-0.2654
<i>CRO_Board</i>	0.6034	1.8523***	1.44***	1.1232***
<i>Dom_Foreign</i>	0.9863	0.6883**	2.4543***	1.8673***
<i>Gender</i>	-0.2329	0.4811	-0.3289	-2.5346***
<i>Board_Ind</i>	0.1524	-0.5169	0.1967***	2.4682***
<i>Board_Size</i>	0.1303***	-0.1463**	0.9506***	-0.0565*
<i>Board_SizeSquared</i>	-	-	-4.6021***	-
<i>Bank_Size</i>	-0.2821***	0.0045	0.3629***	-0.1573***
<i>CAR</i>	-0.0958***	0.0127	-0.1233***	-0.1100***
<i>Business_Model</i>	0.3172***	0.5532***	0.3168***	0.3050***
<i>Board_Ind*Board_Size</i>	-0.5135***	0.0033	-0.6439	-
<i>QualExp*Training</i>	-0.5373	0.5383	-0.2682	-
<i>ActiveRisk_Com*CRO_Board</i>	-0.9661***	-2.4019***	-0.7802	-
Sargan	0.1716		0.4282	
AR(1)	0.216		0.1613	
AR(2)	0.285		0.3705	

Notes: *, **, *** denotes significance at 10%, 5%, 1% in that order.
Source: Authors' computation.

The pooled OLS estimation findings presented in column 3, Table 5 indicate that only risk committee and qualifications and experience have a significant impact on risk outcomes. The coefficient for the variable *Risk_Com* is positive and significant, thereby validating earlier findings that establishing risk committees in emerging markets is associated with higher risk outcomes. Moreover, the pooled OLS results indicate that the appointment of risk experts to bank boards in emerging markets ameliorates excessive risk behavior. This finding is intuitive in the sense that a board member experienced and skilled in risk management is better able to evaluate the level of risk in a transaction (Minton et al., 2014), thereby better able to monitor and control the risk activities of managers. Although most of the risk governance indicators have insignificant coefficients, the point estimates signs are consistent with earlier baseline model results. The interacting term *ActiveRisk_Com*CRO_Board* also has a similar impact to the baseline model findings. Likewise, the results in column 5, Table 5 concur with the parsimonious model; an active risk committee with a CRO on the board is associated with lower risk.

Lastly, following Battaglia and Gallo (2017) and de Andres and Vallelado (2008) the study introduces the square of board size, *Board_SizeSquared*, to account for the non-linear association between board size and bank risk. The results show a negative and significant coefficient sign, meaning that a non-linear relationship exists between board size and bank risk. This evidence corroborates with Battaglia and Gallo (2017) and suggests that the addition of board members reduces bank risk up to a certain optimal level and starts diminishing.

6. CONCLUSION

Motivated by the dearth of literature regarding the interactive role of risk governance on risk activities of banks in emerging markets, Africa in

particular, this study explored the interplay between risk governance and risk-taking behavior on a cross-country sample of forty-one banks in twelve African economies. Empirical results yielded some mixed and interesting findings. The study found that the presence of a standalone risk committee, training in risk management and related courses, and the appointment of the CRO on the board increases instead of decreasing bank risk. Qualifications and experience in risk management or finance and the establishment of a CRO position have an insignificant impact on risk outcomes. Intuitively, the study found that female representation leads to more risk aversion decisions and supports ongoing calls to support women's representation on boards. A key takeaway from this study is that establishing effective risk governance systems in Africa creates incentives for banks to take more risk, possibly on the backdrop of increased risk awareness and oversight. Moreover, our findings support the notion that risk governance mechanisms that align the interests of managers and shareholders create incentives for higher risk as managers seek high risk and valuable investments that create more wealth for shareholders. This counterintuitive behavior calls for the design of relevant governance and regulatory mechanisms that curtail bank risk in the African context.

The interaction terms demonstrated that an independent and small board as well as a board with an active risk committee and a CRO on the board have a positive effect on risk outcomes. Thus, although there is no optimal board size, the study advocates for smaller boards with a higher proportion of independent boards in emerging markets, Africa in particular. This evidence also supports corporate governance codes that advocate for highly independent boards. Moreover, the results support frequent meetings of the risk committee as this enables them to be well informed and up-to-date with the risk activities of the managers. The results also show that CRO appointment to

the board only adds value, concerning risk oversight, if the risk committee meets frequently. On the other hand, the study found that providing professional training to board members with risk/finance expertise does not have a positive effect on bank risk. To maximize returns from professional training and continuous board development banks should target non-risk and non-finance experts for such training. Stulz (2014) argues that such members do not have sufficient expertise to implement appropriate risk management policies that reduce risk; hence, professional training goes a long way in improving their risk management and oversight skills.

The unavailability of data-limited an in-depth exploration of numerous governance attributes that may affect the risk activities of bank managers. Moreover, although the study attempted to cover data gaps by hand collecting missing variables from the banks' annual reports posted on their websites, not all the variables were available for the sampled banks leading to an unbalanced panel which may affect the research findings. Further studies can try to replicate the study by using survey data obtainable through questionnaires and/or interviews and add other dimensions of risk governance such as board processes, reporting line of the CRO, extend of CRO autonomy, CEO age, or country governance, and regulatory aspects into the analysis.

REFERENCES

- Adams, R. B., & Funk, P. (2012). Beyond the glass ceiling: Does gender matter? *Management Science*, 58(2), 219-235. <https://doi.org/10.1287/mnsc.1110.1452>
- Aebi, V., Sabato, G., & Schmid, M. (2012). Risk management, corporate governance, and bank performance in the financial crisis. *Journal of Banking & Finance*, 36(12), 3213-3226. <https://doi.org/10.1016/j.jbankfin.2011.10.020>
- Akbar, S., Kharabsheh, B., Poletti-Hughes, J., & Shah, S. Z. A. (2017). Board structure and corporate risk taking in the UK financial sector. *International Review of Financial Analysis*, 50, 101-110. <https://doi.org/10.1016/j.irfa.2017.02.001>
- Aleemi, A. R., Uddin, I., & Kashif, M. (2019). Competition and risk-taking behavior of banks: New evidence from market power and capital requirements. *Pakistan Business Review*, 21(3), 540-559. Retrieved from https://www.researchgate.net/publication/343255508_COMPETITION_AND_RISK_TAKING_BEHAVIOR_OF_BANKS_NEW_EVIDENCE_FROM_MARKET_POWER_AND_CAPITAL_REQUIREMENTS
- Aljughaiman, A. A., & Salama, A. (2019). Do banks effectively manage their risks? The role of risk governance in the MENA region. *Journal of Accounting and Public Policy*, 38(5), 106680. <https://doi.org/10.1016/j.jaccpubpol.2019.106680>
- Allen, F., Carletti, E., & Marquez, R. (2011). Credit market competition and capital regulation. *The Review of Financial Studies*, 24(4), 983-1018. <https://doi.org/10.1093/rfs/hhp089>
- Allen, F., & Gale, D. (2000). *Comparing financial systems*. Cambridge, MA: The MIT Press.
- Altunbas, Y., Manganelli, S., & Marques-Ibanez, D. (2017). Realized bank risk during the great recession. *Journal of Financial Intermediation*, 32, 29-44. <https://doi.org/10.1016/j.jfi.2017.08.001>
- Anginer, D., Demirgüç-Kunt, A., Huizinga, H., & Ma, K. (2018). Corporate governance of banks and financial stability. *Journal of Financial Economics*, 130(2), 327-346. <https://doi.org/10.1016/j.jfineco.2018.06.011>
- Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies*, 58(2), 277-297. <https://doi.org/10.2307/2297968>
- Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics*, 68(1), 29-51. [https://doi.org/10.1016/0304-4076\(94\)01642-D](https://doi.org/10.1016/0304-4076(94)01642-D)
- Ashraf, B. N., Arshad, S., & Hu, Y. (2016). Capital regulation and bank risk-taking behavior: evidence from Pakistan. *International Journal of Financial Studies*, 4(3), 1-20. <https://doi.org/10.3390/ijfs4030016>
- Bailey, C. (2019). The relationship between chief risk officer expertise, ERM quality, and firm performance. *Journal of Accounting, Auditing & Finance*, 37(1), 205-228. <https://doi.org/10.1177/0148558X19850424>
- Baret, S., & Hida, E. (2017). *What's next for bank board risk governance? Recalibrating to tackle new risk oversight expectations*. Deloitte. Retrieved from <https://www2.deloitte.com/content/dam/Deloitte/lu/Documents/financial-services/Banking/lu-what-next-bank-board-risk-governance.pdf>
- Barrell, R., Davis, E. P., Fic, T., & Karim, D. (2010). *Is there a link from bank size to risk taking?* (National Institute of Economic and Social Research Discussion Paper No. 367). Retrieved from https://www.niesr.ac.uk/wp-content/uploads/2021/10/dp367_0-2.pdf
- Basel Committee on Banking Supervision. (2015). *Corporate governance principles for banks*. Bank for International Settlement. Retrieved from <https://www.bis.org/publ/bcbs294.pdf>
- Battaglia, F., & Gallo, A. (2017). Strong boards, ownership concentration and EU banks' systemic risk-taking: Evidence from the financial crisis. *Journal of International Financial Markets, Institutions and Money*, 46, 128-146. <https://doi.org/10.1016/j.intfin.2016.08.002>
- Bebchuk, L. A. (2002). The case against board veto in corporate takeovers. *The University of Chicago Law Review*, 69(3), 973-1035. <https://doi.org/10.2307/1600639>
- Beltratti, A., & Stulz, R. M. (2012). The credit crisis around the globe: Why did some banks perform better? *Journal of Financial Economics*, 105(1), 1-17. <https://doi.org/10.1016/j.jfineco.2011.12.005>
- Berger, A. N., Imbierowicz, B., & Rauch, C. (2016). The roles of corporate governance in bank failures during the recent financial crisis. *Journal of Money, Credit and Banking*, 48(4), 729-770. <https://doi.org/10.1111/jmcb.12316>
- Berger, A. N., Kick, T., & Schaeck, K. (2014). Executive board composition and bank risk taking. *Journal of Corporate Finance*, 28, 48-65. <https://doi.org/10.1016/j.jcorpfin.2013.11.006>
- Bhuiyan, M. B. U., Cheema, M. A., & Man, Y. (2021). Risk committee, corporate risk-taking and firm value. *Managerial Finance*, 47(3), 285-309. <https://doi.org/10.1108/MF-07-2019-0322>
- Bitar, M., Pukthuanthong, K., & Walker, T. (2018). The effect of capital ratios on the risk, efficiency and profitability of banks: Evidence from OECD countries. *Journal of International Financial Markets, Institutions and Money*, 53, 227-262. <https://doi.org/10.1016/j.intfin.2017.12.002>

24. Blinco, S., Galbarz, M., Hohl, S., & Zamil, R. (2020). *Bank boards — A review of post-crisis regulatory approaches* (FSI Insights on policy implementation No. 25). Bank for International Settlement. Retrieved from <https://www.bis.org/fsi/publ/insights25.pdf>
25. Blum, J. (1999). Do capital adequacy requirements reduce risks in banking? *Journal of Banking & Finance*, 23(5), 755–771. [https://doi.org/10.1016/S0378-4266\(98\)00113-7](https://doi.org/10.1016/S0378-4266(98)00113-7)
26. Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87(1), 115–143. [https://doi.org/10.1016/S0304-4076\(98\)00009-8](https://doi.org/10.1016/S0304-4076(98)00009-8)
27. Bouwman, C. H., Kim, H., & Shin, S.-O. S. (2018). *Bank capital and bank stock performance* (Mays Business School Research Paper No. 3007364). <https://doi.org/10.2139/ssrn.3007364>
28. Boyd, J. H., & De Nicolo, G. (2005). The theory of bank risk taking and competition revisited. *The Journal of Finance*, 60(3), 1329–1343. <https://doi.org/10.1111/j.1540-6261.2005.00763.x>
29. Chang, X., & Zhang, H. F. (2015). Managerial entrenchment and firm value: A dynamic perspective. *Journal of Financial and Quantitative Analysis*, 50(5), 1083–1103. <https://doi.org/10.1017/S0022109015000423>
30. Chen, S., Nazir, M. I., Hashmi, S. H., & Shaikh, R. (2019). Bank competition, foreign bank entry, and risk-taking behavior: Cross country evidence. *Journal of Risk and Financial Management*, 12(3), 106–132. <https://doi.org/10.3390/jrfm12030106>
31. Coyle, B. (2010). *Corporate governance* (5th ed.). ICSA Study Text. Retrieved from <https://pdfcoffee.com/corporate-governance-textpdf-pdf-free.html>
32. Dam, L., & Koetter, M. (2012). Bank bailouts and moral hazard: Empirical evidence from Germany. *The Review of Financial Studies*, 25(8), 2343–2380. <https://doi.org/10.1093/rfs/hhs056>
33. Danisman, G. O., & Demirel, P. (2019). Bank risk-taking in developed countries: The influence of market power and bank regulations. *Journal of International Financial Markets, Institutions and Money*, 59, 202–217. <https://doi.org/10.1016/j.intfin.2018.12.007>
34. Das, S., & Sy, A. (2012). *How risky are banks' risk weighted assets? Evidence from the financial crisis* (IMF Working Paper No. 036). <https://doi.org/10.5089/9781463933791.001>
35. de Andres, P., & Vallelado, E. (2008). Corporate governance in banking: The role of board of directors. *Journal of Banking & Finance*, 32(12), 2570–2580. <https://doi.org/10.1016/j.jbankfin.2008.05.008>
36. Demirgüç-Kunt, A., & Detragiache, E. (2002). Does deposit insurance increase banking system stability? An empirical investigation. *Journal of Monetary Economics*, 49(7), 1373–1406. [https://doi.org/10.1016/S0304-3932\(02\)00171-X](https://doi.org/10.1016/S0304-3932(02)00171-X)
37. DeYoung, R., Peng, E. Y., & Yan, M. (2013). Executive compensation and business policy choices at U.S. commercial banks. *Journal of Financial and Quantitative Analysis*, 48(1), 165–196. <https://doi.org/10.1017/S0022109012000646>
38. Dlamini, B., Tapera, J., & Chivasa, S. (2017). Can sound corporate governance alleviate corporate failure? A study of the Zimbabwean financial services sector. *Journal of Economics and Behavioral Studies*, 9(2), 88–95. [https://doi.org/10.22610/jebs.v9i2\(J\).1652](https://doi.org/10.22610/jebs.v9i2(J).1652)
39. Dong, Y., Meng, C., Firth, M., & Hou, W. (2014). Ownership structure and risk-taking: Comparative evidence from private and state-controlled banks in China. *International Review of Financial Analysis*, 36, 120–130. <https://doi.org/10.1016/j.irfa.2014.03.009>
40. Ellul, A. (2015). The role of risk management in corporate governance. *Annual Review of Financial Economics*, 7, 279–299. <https://doi.org/10.1146/annurev-financial-111414-125820>
41. Ellul, A., & Yerramilli, V. (2013). Stronger risk controls, lower risk: Evidence from U.S. bank holding companies. *The Journal of Finance*, 68(5), 1757–1803. <https://doi.org/10.1111/jofi.12057>
42. Epo, B. N., & Nochi Faha, D. R. (2020). Natural resources, institutional quality, and economic growth: An African tale. *The European Journal of Development Research*, 32(1), 99–128. <https://doi.org/10.1057/s41287-019-00222-6>
43. Fama, E. F., & Jensen, M. C. (1983). Separation of ownership and control. *The Journal of Law and Economics*, 26(2), 301–325. <https://doi.org/10.1086/467037>
44. Felício, A. J., Rodrigues, R., Grove, H., & Greiner, A. (2018). The influence of corporate governance on bank risk during a financial crisis. *Economic Research-Ekonomska Istraživanja*, 31(1), 1078–1090. <https://doi.org/10.1080/1331677X.2018.1436457>
45. Fernandes, C., Farinha, J., Martins, F. V., & Mateus, C. (2021). The impact of board characteristics and CEO power on banks' risk-taking: Stable versus crisis periods. *Journal of Banking Regulation*, 22, 319–341. <https://doi.org/10.1057/s41261-021-00146-4>
46. García-Marco, T., & Robles-Fernandez, M. D. (2008). Risk-taking behaviour and ownership in the banking industry: The Spanish evidence. *Journal of Economics and Business*, 60(4), 332–354. <https://doi.org/10.1016/j.jeconbus.2007.04.008>
47. Gómez-Escalonilla, E., & Parte, L. (2017). Board knowledge and bank risk-taking. An international analysis. In A. Pinto & D. Zilberman (Eds.), *Modeling, dynamics, optimization and bioeconomics IV* (pp. 229–243). https://doi.org/10.1007/978-3-030-78163-7_10
48. Gottschalk, R. (2014). *Institutional challenges for effective banking regulation and supervision in Sub-Saharan Africa* (ODI Working Paper No. 406). Retrieved from <https://cdn.odi.org/media/documents/9280.pdf>
49. Hair, J. F., Jr., Back, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis* (7th ed.). Upper Saddle River, NJ: Pearson.
50. Heid, F., Porath, D., & Stolz, S. (2004). *Does capital regulation matter for bank behaviour? Evidence for German savings banks* (Discussion Paper Series No. 03). <https://doi.org/10.2139/ssrn.2793955>
51. Heremans, D. (2007). *Corporate governance issues for banks. A financial stability perspective* (CES-Discussion Paper Series 07.07, pp. 1–28). <https://doi.org/10.2139/ssrn.1024693>
52. Hussein, K. (2008). Does bank concentration increase credit risk-taking behaviour? Evidence from SADC. *African Journal of Finance and Management*, 17(1), 14–44. <https://doi.org/10.2139/ssrn.1607706>
53. International Finance Corporation (IFC). (2015). *Risk culture, risk governance, and balanced incentives: Recommendations for strengthening risk management in emerging market banks*. Retrieved from <https://cutt.ly/NI3nYBh>

54. Jacques, K., & Nigro, P. (1997). Risk-based capital, portfolio risk, and bank capital: A simultaneous equations approach. *Journal of Economics and Business*, 49(6), 533-547. [https://doi.org/10.1016/S0148-6195\(97\)00038-6](https://doi.org/10.1016/S0148-6195(97)00038-6)
55. Jiang, L., Levine, R., & Lin, C. (2018). *Does competition affect bank risk?* (NBER Working Paper No. 23080). <https://doi.org/10.3386/w23080>
56. Jiménez, G., Lopez, J. A., & Saurina, J. (2013). How does competition affect bank risk-taking? *Journal of Financial Stability*, 9(2), 185-195. <https://doi.org/10.1016/j.jfs.2013.02.004>
57. Jokipii, T., & Milne, A. (2011). Bank capital buffer and risk adjustment decisions. *Journal of Financial Stability*, 7(3), 165-178. <https://doi.org/10.1016/j.jfs.2010.02.002>
58. Kaufmann, D., Kraay, A., & Mastruzzi, M. (2009). *Governance matters VIII: Aggregate and individual governance indicators 1996-2008* (World Bank Policy Research Paper No. 4978). World Bank Group. <https://doi.org/10.1596/1813-9450-4978>
59. Keeley, M. C. (1990). Deposit insurance, risk, and market power in banking. *The American Economic Review*, 80(5), 1183-1200. Retrieved from <https://www.jstor.org/stable/2006769>
60. Kirkpatrick, G. (2009). The corporate governance lessons from the financial crisis. *OECD Journal: Financial Market Trends*, 2009(1), 61-87. <https://doi.org/10.1787/fmt-v2009-art3-en>
61. Knaup, M., & Wagner, W. (2012). Forward-looking tail risk exposures at U.S. bank holding companies. *Journal of Financial Services Research*, 42(1), 35-54. <https://doi.org/10.1007/s10693-012-0131-5>
62. Koehn, M., & Santomero, A. M. (1980). Regulation of bank capital and portfolio risk. *The Journal of Finance*, 35(5), 1235-1244. <https://doi.org/10.1111/j.1540-6261.1980.tb02206.x>
63. Laeven, L., & Levine, R. (2009). Bank governance, regulation and risk taking. *Journal of Financial Economics*, 93(2), 259-275. <https://doi.org/10.1016/j.jfineco.2008.09.003>
64. Lingel, A., & Sheedy, E. A. (2012). *The influence of risk governance on risk outcomes — International evidence* (Macquarie Applied Finance Centre Research Paper No. 37). <https://doi.org/10.2139/ssrn.2187116>
65. Marques, L. B., & Oppers, S. E. (2014). Risk-taking by banks: The role of governance and executive pay. In *Global financial stability report: Risk taking, liquidity, and shadow banking — Curing excess while promoting growth* (pp. 105-142). Retrieved from <https://www.elibrary.imf.org/view/books/082/21397-9781498390811-en/ch003.xml>
66. Martin, C. J. G., & Herrero, B. (2018). Boards of directors: Composition and effects on the performance of the firm. *Economic Research-Ekonomska Istraživanja*, 31(1), 1015-1041. <https://doi.org/10.1080/1331677X.2018.1436454>
67. Mateos De Cabo, R., Gimeno, R., & Nieto, M. J. (2012). Gender diversity on European banks' boards of directors. *Journal of Business Ethics*, 109(2), 145-162. <https://doi.org/10.1007/s10551-011-1112-6>
68. May, D. O. (1995). Do managerial motives influence firm risk reduction strategies? *The Journal of Finance*, 50(4), 1291-1308. <https://doi.org/10.1111/j.1540-6261.1995.tb04059.x>
69. Merton, R. C. (1977). An analytic derivation of the cost of deposit insurance and loan guarantees an application of modern option pricing theory. *Journal of Banking & Finance*, 1(1), 3-11. [https://doi.org/10.1016/0378-4266\(77\)90015-2](https://doi.org/10.1016/0378-4266(77)90015-2)
70. Mertzanis, H. (2011). The financial crisis and corporate governance reform. *International Journal of Business Governance and Ethics*, 6(1), 83-109. Retrieved from https://www.researchgate.net/publication/264834526_The_financial_crisis_and_corporate_governance_reform
71. Minton, B. A., Taillard, J. P., & Williamson, R. (2014). Financial expertise of the board, risk taking, and performance: Evidence from bank holding companies. *Journal of Financial and Quantitative Analysis*, 49(2), 351-380. <https://doi.org/10.1017/S0022109014000283>
72. Mongiardino, A., & Plath, C. (2010). Risk governance at large banks: Have any lessons been learned? *Journal of Risk Management in Financial Institutions*, 3(2), 116-123. Retrieved from <https://hstalks.com/article/3150/risk-governance-at-large-banks-have-any-lessons-be/>
73. Mutarindwa, S., Schäfer, D., & Stephan, A. (2018). *Corporate governance in African banks: The role of institutions and corporate governance code*. Retrieved from <https://cutt.ly/DI3DwHs>
74. Nguyen, D. D., Hagendorff, J., & Eshraghi, A. (2016). Can bank boards prevent misconduct? *Review of Finance*, 20(1), 1-36. <https://doi.org/10.1093/rof/rfv011>
75. OECD. (2014). *Risk management and corporate governance, corporate governance* (OECD Report). <https://doi.org/10.1787/9789264208636-en>
76. Otero, L., Alaraj, R., & Lado-Sestayo, R. (2020). How corporate governance and ownership affect banks' risk taking in the MENA countries? *European Journal of Management and Business Economics*, 29(2), 182-198. <https://doi.org/10.1108/EJMBE-01-2019-0010>
77. Owino, B., & Kivoi, D. L. (2016). Corporate governance and bank performance: A case of Kenya's banking sector. *Journal of Research in Humanities and Social Science*, 1(1), 33-46. Retrieved from https://www.researchgate.net/publication/306391757_Corporate_Governance_and_Bank_Performance_A_Case_of_Kenya's_Banking_Sector
78. Pathan, S. (2009). Strong boards, CEO power and bank risk-taking. *Journal of Banking & Finance*, 33(7), 1340-1350. <https://doi.org/10.1016/j.jbankfin.2009.02.001>
79. Pour, K. E., & Murinde, V. (2018). *National culture, CEO power and risk-taking by global banks*. Retrieved from <https://cutt.ly/q13GlCx>
80. Ruparelia, R., & Njuguna, A. (2016). Relationship between board remuneration and financial performance in the Kenyan financial services industry. *International Journal of Financial Research*, 7(2), 247-255. <https://doi.org/10.5430/ijfr.v7n2p247>
81. Sánchez, J. L. F., Zamanillo, M. D. O., & Luna, M. (2020). How corporate governance mechanisms of banks have changed after the 2007-08 financial crisis. *Global Policy*, 11(S1), 52-61. <https://doi.org/10.1111/1758-5899.12748>
82. Shleifer, A., & Vishny, R. W. (1997). A survey of corporate governance. *The Journal of Finance*, 52(2), 737-783. <https://doi.org/10.1111/j.1540-6261.1997.tb04820.x>
83. Sila, V., Gonzalez, A., & Hagendorff, J. (2016). Women on board: Does boardroom gender diversity affect firm risk? *Journal of Corporate Finance*, 36, 26-53. <https://doi.org/10.1016/j.jcorpfin.2015.10.003>
84. Srivastav, A., & Hagendorff, J. (2016). Corporate governance and bank risk-taking. *Corporate Governance: An International Review*, 24(3), 334-345. <https://doi.org/10.1111/corg.12133>

85. Stulz, R. M. (2014). *Governance, risk management, and risk-taking in banks* (NBER Working Paper No. 20274). <https://doi.org/10.3386/w20274>
86. Subramaniam, N., McManus, L., & Zhang, J. (2009). Corporate governance, firm characteristics and risk management committee formation in Australian companies. *Managerial Auditing Journal*, 24(4), 316–339. <https://doi.org/10.1108/02686900910948170>
87. Türsoy, T. (2018). *Risk management process in banking industry* (MPRA Paper No. 86427). Retrieved from https://mpra.ub.uni-muenchen.de/86427/1/MPRA_paper_86427.pdf
88. United Nations. (2010). *Corporate governance in the wake of the financial crisis*. Retrieved from https://unctad.org/system/files/official-document/diaeed20102_en.pdf
89. Vallascas, F., Mollah, S., & Keasey, K. (2017). Does the impact of board independence on large bank risks change after the global financial crisis? *Journal of Corporate Finance*, 44, 149–166. <https://doi.org/10.1016/j.jcorpfin.2017.03.011>
90. Victoravich, L. M., Buslepp, W. L., Xu, T., & Grove, H. (2011). CEO power, equity incentives, and bank risk taking. *Banking and Finance Review*, 3(2), 105–120. <https://doi.org/10.2139/ssrn.1909547>
91. Walker, D. (2009). *A review of corporate governance in UK banks and other financial industry entities*. Retrieved from <https://corpgov.law.harvard.edu/2009/12/26/a-review-of-corporate-governance-in-uk-banks-and-other-financial-industry-entities/>
92. Zhang, X., Li, F., Xu, Y., & Ortiz, J. (2021). Economic uncertainty and bank risk: The moderating role of risk governance. *Economic Research-Ekonomska Istraživanja*. <https://doi.org/10.1080/1331677X.2021.1985568>

APPENDIX

Table A.1. List of countries and banks

No.	Country	Initial No. of banks	Actual No. of banks used
1	Botswana	4	1
2	Ghana	9	4
3	Kenya	2	7
4	Malawi	6	2
5	Mauritius	2	2
6	Nigeria	13	9
7	Rwanda	4	1
8	South Africa	4	3
9	Tanzania	3	1
10	Uganda	3	1
11	Zambia	12	5
12	Zimbabwe	6	5
	Total	68	41

Source: <https://africanfinancials.com/>

Table A.2. Correlation matrix

Variable	RWA_TA	Risk_Com	QualExp	ActiveRisk_Com	Training	CRO_Presence	CRO_Board	Dom_Foreign	Gender	Board_Ind	Board_Size	Bank_Size	CAR	Business_Model
RWA_TA	1.0000													
Risk_Com	0.0404	1.0000												
QualExp	-0.0827	0.2951*	1.0000											
ActiveRisk_Com	-0.1026*	0.2103*	-0.0777	1.0000										
Training	-0.0669	0.0967*	0.1383*	0.0140	1.0000									
CRO_Presence	0.0621	-0.1632*	0.1564*	-0.11*	0.167*	1.0000								
CRO_Board	0.2923*	0.1007*	0.0085	-0.149*	-0.04*	0.2093*	1.0000							
Dom_Foreign	0.1435*	-0.0631	-0.2227	0.2774*	0.0418	-0.0366	0.0483	1.0000						
Gender	-0.0909	-0.1074*	0.0305	0.0866	0.241*	0.0764	-0.014	0.0420	1.0000					
Board_Ind	0.0181	-0.3061*	0.2746*	0.1011	-0.12*	0.1554*	-0.20*	0.0985	-0.1015	1.0000				
Board_Size	-0.0553	0.0591	0.0802	-0.176*	-0.016	-0.0013	0.332*	-0.075	-0.058	-0.29*	1.0000			
Bank_Size	0.0711	0.2230*	-0.0623	0.0296	-0.14*	-0.31*	0.11*	0.211*	-0.0426	-0.081	0.0073	1.0000		
CAR	-0.0311	0.0025	0.0287	-0.0667	-0.036	0.0872	0.0470	0.0263	-0.0974	-0.066	-0.0343	-0.0777	1.0000	
Business_Model	0.4417*	0.0041	-0.0342	-0.0156	-0.051	0.0182	0.138*	0.0362	-0.0334	-0.007	-0.0188	0.0599	0.0244	1.0000

Notes: * indicates statistical significance at 5%.

Source: Own construction based on sample data.