How do Board and Ownership Characteristics affect Bank Risk-Taking? New Evidence from Sub-Saharan Africa

Abstract

The study examines the impact of board attributes, ownership structures and other bank-specific factors on bank risk-taking. Using a sample of 220 banks in 16 Sub-Saharan Africa countries for the years 2007 to 2018, the findings of the study are four-fold. First, the findings indicate that, independent directors who are financial experts reduce bank risk-taking. Second, the study finds that the number of board meetings has a negative impact on bank risk-taking. Third, the estimation results suggest that government and foreign ownership encourage banks to take more risks. Finally, the study observes that, institutional shareholder ownership influence bank risk-taking negatively. We observe that an increase in the ownership stake held by long-term institutional investors is associated with a decrease in risk-taking. Furthermore, we show that the predicted relationships vary across different periods. The findings are robust to different types of endogeneities and alternative measures of bank risk-taking. The study concludes that different corporate governance characteristics have different implications for banks' risk-taking in the region. The findings have key policy implications for banking practitioners, regulators, and policy makers in the region.

Keywords

Corporate governance; risk-taking; banking crisis; governance reforms

Introduction

The recent global financial crises uncovered how excessive risk-taking can lead to failure of banks with significant reputational and serious contagious consequences in the global economy. In particular, the crises demonstrated how vulnerable unprotected economies are to excessive risk-taking by banks [55]. Scholars therefore maintain that the success of the banking sector depends on the level of risk-taking [3, 55]. For Zhou et al. [125], the susceptibility of the banking sector to financial crisis originates from the accumulation of irresponsible risk-taking. More importantly, the banking literature attributes risk-taking as the prime origin of the recent bank failures in the Sub-Saharan Africa (SSA) banking system [3, 9, 16].

Within the SSA context, scholars and banking practitioners contend that corporate governance (CG) structures fail to protect the regions' banking system from excessive risk-taking [3, 10, 16]. For instance, poor CG practices in the banking sector have been underscored as one of the causes of excessive risk-taking [1, 42, 114, 125]. Accordingly, Stulz [114] maintains that weak CG mechanisms can play a pivotal role in pushing banks towards unacceptable level of risk-taking. There is therefore a growing recognition that CG mechanisms can enhance stability in the banking system through effective monitoring and curbing of irresponsible risk-taking [113].

Consequently, there is an increasing research and regulatory interest in finding means of mitigating excessive risk-taking in the banking system [113]. For instance, Mérő [87], posits that the global financial crisis has resulted in a shift in the regulatory approach to banking regulation. Thus, in the post-crisis era, policy makers and regulators are focusing on improved and quality CG mechanisms as a means of reducing excessive bank risk-taking [55, 125]. In particular, the recent regulatory reforms in the SSA banking sectors have largely focused on restructuring CG mechanisms to serve as a key lever that can limit excessive risk-taking in the

region. Specifically, and driven by the need to strengthen the quality of CG in the SSA countries, policy makers in the region have pursued governance and regulatory reforms aimed at enhancing the effectiveness of the CG mechanisms, especially within the banking sectors over the last two decades [49, 97, 119].

The CG reforms were implemented following failures of banks in the region, such as Nedbank companies in South Africa [97]. Briefly, the CG reforms which are mainly in the form of issue of CG codes of best practices place great importance on reforming CG in order to protect the interest of all stakeholders by limiting irresponsible risk-taking [85, 98, 103]. For instance, the King Reports on CG of South Africa, as well as those relating to Ghana, Kenya, and Nigeria are all inherently focused on mitigating excessive risk-taking. However, the crucial policy question is whether the CG reforms undertaken within the countries over the last two decades have any influence on risk-taking in the SSA banking sectors.

Admittedly, a number of possible theoretical explanations exist. For example, agency theory suggests that an increase in the monitoring role of the board can reduce management opportunism and discretion, which may affect bank risk-taking [53, 71]. In this case, agency theory posits that, in order for the board to perform risk-taking monitoring tasks, the directors need the right skills and expertise [53]. Similarly, stakeholder theory predicts that effective CG mechanisms can lead to the alignment of the risk preferences of stakeholders and managers which can influence risk-taking behaviour of banks [26, 79]. Also, resource dependence theory highlights the role ownership structures play in ensuring the flow of critical resources to banks. This theoretical perspective maintains that agency conflict may be reduced by putting in place shareholders with better capacity to monitor managers [70].

Empirically, previous studies have examined the impact of CG structures on bank risk-taking [18, 20, 47, 51, 125). For example, Zhou et al. [125], examine whether chair-CEO age dissimilarity can mitigate banks' excessive risk-taking behaviour in a sample of 100 European banks between 2005 and 2014. The authors observe that age difference between the chair and the CEO reduces bank risk-taking. Apergis [17], also finds that financial experts on the board contribute to higher risks, especially for large banks in a sample of 41 banks in the UK from 2001 to 2016. Further, Ellul and Yerramilli [51] investigation in the US also reveal that, banks in the US with substantial institutional investors tend to be cautious in their risk-taking in a sample of 100 US banks from 1995 to 2010. Ayadi and Boujèlbène [18] document a negative link between the number of board meetings and risk-taking in 30 European banks over the period of 2004-2009.

However, to the best of authors' knowledge, the issue of whether board and ownership mechanisms affect SSA bank risk-taking has not been sufficiently analysed. Therefore, the study attempts to bridge this gap, specifically by using a cross-country sample of SSA banks to analyse the impact of a set of board and ownership mechanisms on risk-taking. The underlying idea is that board and ownership mechanisms may have a different impact on risk-taking in developed and developing banking sectors. The SSA setting is particularly appropriate for this study because the region presents distinct banking features along with noticeable considerable weaknesses concerning their internal CG structures [49, 79, 97, 101]. For example, the SSA banks are characterised by high concentrated ownership [85, 98, 101, 103]. In addition, the concentrated ownership in the SSA region is mainly in the form of family- or government- and foreign-owned banks [49, 98, 122]. In particular, in SSA countries, such as Ghana, Nigeria, Tanzania and Zimbabwe, bank ownership concentration takes the form of strategic government and family holdings, often leading to cronyism, favouritism, and tribalism

in board appointments [98]. Arguably, this might have crucial implications on bank risk-taking in the region. Again, the banks in region are also characterised by weak regulatory framework, poor investor protection and ineffective external governance mechanisms primarily due to weak government monitoring and enforcement of banking regulations [49, 74, 122]. This raise concerns as to whether the CG reforms pursued in the SSA countries can be effective in mitigating excessive bank risk-taking in the region.

Consequently, in this study, the aim is to contribute to the existing literature by examining the extent to which unexplored CG structures such as board attributes and ownership structures can influence risk-taking behaviour of banks in the SSA region. Specifically, the study seeks to contribute to the extant banking literature in two main ways. First, the study offers new evidence on the effect of board attributes (i.e., independent directors who are financial experts and number of board meetings) on bank risk-taking in SSA countries. Whereas much academic research has studied the impact of independent directors who are financial experts and board meetings on risk-taking in developed markets, cross-country evidence in a developing region is rare [25]. Distinct from prior studies [25, 29], the study provides new insights following CG reforms that have focused primarily on reforming CG in order to curb excessive risk-taking.

Second, this study contributes to post privatization of state ownership literature in banking and risk-taking by focusing on SSA region [28, 91]. Notably, it extends this analysis to the region by examining the three most dominant bank ownership types; institutional, government and foreign ownership. Several prior research has explored how bank ownership structure may influence risk-taking [28, 91]. However, most of these studies focus on international sample, whereas others are US or Europe-specific, with comparatively few studies focusing on

developing countries [62, 81]. Particularly, cross-country empirical evidence in the SSA region is rare [105]. Therefore, this study provides new insights in SSA banking context.

The findings of the study show that independent directors who are financial experts and the number of board meetings decrease bank risk-taking. Additionally, the study finds that institutional ownership has a negative impact on risk-taking. Also, the study documents that government and foreign ownership encourage banks to take more risks. The findings, therefore, indicate that the impact of these CG mechanisms on risk-taking is crucial in the regions' banking system.

The rest of the paper is structured as follows. Section 2 offers the theoretical framework of the study. Section 3 presents the literature review and the hypotheses development. Section 4 describes the data, methodology and descriptive statistics. Section 5 provides the empirical results. Section 6 provides the conclusions.

Theoretical framework

It has been suggested that the association between CG mechanisms and bank risk-taking could not be explained based on a single theoretical framework [53]. This is because, no individual theory can adequately capture the complex relationships [110]. For example, as individual theories, they have a number of weaknesses including high levels of distrust and abuse of managerial power (agency theory), and extreme focus on financial stakeholders (resource dependence and stakeholder theories) [102, 110]. Hence, individually, these theories are unable to fully explore the complex CG and risk-taking relationship on their own.

Nonetheless, their explanatory power can be improved when they are combined [3, 86, 110]. In line with recent calls for the adoption of multi-dimensional theoretical framework in CG studies [63, 110], the study adopts a multiple theoretical perspective in setting the hypotheses and interpreting the results. Noticeably, prior studies have employed a number of different theories to investigate the association between CG and risk-taking, including agency, resource dependence and stakeholder theories [10, 25, 53]. The arguments driven by these theories indicate that the CG mechanisms such as board and ownership mechanisms may have a positive, negative or no influence on risk-taking [10, 25, 27].

First, agency theory suggests that boards with more financial experts are better able to perform their monitoring function [90, 121]. It has also been suggested that the monitoring role of the board, may affect bank risk-taking [53]. Evidently, to perform risk-taking monitoring tasks, the directors need the right skills and expertise [3, 53]. Independent directors who are financial experts have a superior monitoring ability which can reduce management opportunism and risk-taking [71]. Thus, agency theory predicts that the appointment of majority independent directors who are financial experts to the board may limit senior managers from engaging in irresponsible risk-taking. Also, to enhance the monitoring role of the board, agency theory calls for regular board meetings [38, 71]. The theory posits that, regular board meetings will lead to better monitoring which can limit managers' discretion, thereby curbing excessive risk-taking. Next, agency theory advocates for the participation of more institutional investors by suggesting that, when institutional shareholders have substantial investments in several banks operating in the same region, then they will be interested in maximizing the return on all their shares in the region. In this case, excessive risk-taking among their invested banks may be undesirable to such institutional investors as it could potentially reduce the profit margins within the portfolio [104].

Second, stakeholder theory maintains that non-shareholding interest groups of banks tend not to be interested in encouraging managers to engage in excessive risk-taking [26]. Such interest groups of banks focus on the long-term sustainable value creation [3, 26]. They are typically considered as stakeholders with predetermined claim and as such, will receive allotted or predetermined streams of income no matter the profit recorded by the bank [26]. Therefore, the theory calls for strict discipline of managers by independent directors who are financial experts since they can provide better monitoring [79]. Within this framework, regular board meetings can lead to the alignment of the risk preferences of stakeholders and managers which can impact on risk-taking behaviour of banks.

Finally, the association between CG mechanisms and risk-taking can be interpreted from resource dependence theory perspective. The theory proposes that the board should be considered as a useful connection between the bank and players in the environment who control the vital resources needed for the banks' survival [107, 108]. This suggests that the growth and continued existence of banks largely depend on the actions of the board. From this perspective, the board may influence risk-taking behaviour in two main ways. The board is to offer advice and counsel to managers concerning investments decisions [109]. For example, quality advice and counsel by the board may curb the tendency for managerial opportunism and irresponsible risk-taking. Again, from resource dependence theory, the board should provide legitimacy to the transactions of the bank to ensure the flow of critical resources [109]. Importantly, the general practice in the banking system is that loans above a certain threshold should be recommended by management for approval by the board. Thus, the board has the power to decline loans that are inconsistent with the risk preference of the bank.

Furthermore, resource dependence theory highlights the role ownership structures play in ensuring the flow of critical resources to banks. It posits that the agency conflict may be reduced by putting in place owners with better capacity to monitor managers [70]. In this study, we argue that large equity holdings by institutional investors can empower them to better monitor risk-taking behaviour by managers. Hence, banks can leverage on such investors as critical resources to curtail excessive risk-taking. Given the valuable nature of cooperation and reciprocal action of the different interest groups and banks which ensures the drive of essential resources to banks, the theory has key implications for risk-taking in the SSA region. In terms of composition of the board, resource dependence theory calls for the appointment of more independent directors who are financial experts to the board. This may signal to stakeholders that the bank has the needed expertise to run the affairs of the bank, and hence attract the needed critical resources such as deposit. The bank can also benefit from their expertise in terms of early spotting of risk and preferring of risk-mitigation solutions [17].

In addition, the theory specifies that different forms of ownership structure may influence risk-taking. For example, public pension fund investors have substantial stakes in banks in the SSA countries. The benefit of having such shareholders is in twofold. Typically, pension fund investors have low risk preference due to the long-term nature of their commitment to their clients (pensioners). In this regard, such dominant institutional investors with substantial voting power can mitigate excessive risk-taking by imposing their low-risk preference on senior managers. Moreover, there is the tendency for such institutional investors to join forces to effectively monitor managers and limit excessive risk-taking in the SSA region.

Similarly, government ownership in banks may imply receiving the necessary funding from government. Arguably, this may guarantee huge financial resources with little costs, however, this may also influence risk-taking in SSA context. Due to banking reforms in the SSA region over the last three decades, substantial state-ownership in banks in the region has been

transferred to foreign banks [25]. This facilitates the flow of non-financial resources such as import of skills and expertise from foreign owners in developed countries. Importantly, it can potentially lead to local banks receiving financial resources such as having access to external financing in the international market as well as foreign financing from the foreign investors or banks. Nevertheless, this can influence risk-taking in the region. For that purpose, resource dependence theory specifies that independent directors should be composed of enough directors with specialized skills and expertise commensurate with the risk profile of banks [17]. The study therefore applies agency, stakeholder, and resource dependence theories in explaining the influence of board and ownership mechanisms on bank risk-taking in the SSA region.

Literature review and hypotheses development

Independent financial experts and bank risk-taking

According to G¨uner et al. [57] an independent director is considered as a financial expert if he or she a) has held an executive position at a banking institution (former bank executive), (b) holds an executive position at a non-bank financial institution (executive of non-bank financials), (c) holds a finance-related position (e.g., chief financial officer (CFO), accountant, treasurer, vice president (VP) finance) of a non-financial firm (finance executive of non-financials), (d) holds an academic position in a related field (e.g., Professor of accounting, finance or economics), or (e) works as a hedge fund or private equity fund manager, or venture capitalist (professional investor). It has been suggested that board member financial acumen is crucial in highly regulated financial sectors, such as banking [17]. Theoretically, agency theory suggests that independent directors who have financial expertise have higher monitoring capacity to limit managerial opportunism and risk-taking [71]. This argument is based on the notion that, independent financial experts possess superior oversight leading them to help

reduce agency conflicts, thereby protecting shareholders [90]. From stakeholder theory perspective, independent financial experts on the board of banks can increase the monitoring role of the board by offering a superior presentation of stakeholders' interests [112]. Similarly, resource dependence theory considers independent financial experts as key internal governance mechanism that can help attract critical resources to the bank as appreciable knowledge of banking can lead to effective monitoring and oversight of risk-taking [121]. For that purpose, resource dependence theory specifies that independent directors should be composed of enough financial experts with specialized skills and expertise commensurate with the risk profile of banks [17].

In practice, prior studies suggest that financial experts tend to adopt a more conservative approach in making essential corporate decisions such as risk-taking [17, 64]. In particular, Harris and Raviv [64] maintain that financial experts have lesser outlays in obtaining information about the details and the inherent risks associated with banking transactions. In this regard, they can mitigate any inefficiencies in monitoring managers' risk-taking behaviour. Arguably, an appreciable knowledge of banking can lead to better oversight and more efficient risk-taking behaviour because substantial proportion of risk-taking is driven by operations and economic conditions unique to the sector [90, 121]. Moreover, other scholars posit that, banks with more financial experts can benefit from their expertise in terms of early spotting of risk and preferring of risk mitigating solutions [17, 90]. In addition, others suggest that boards with financial knowledge and expertise can distinguish risks that will not pay off and hence avoid such risks [90].

By contrast, others claim that independent directors who are financial experts may act in the interest of shareholders which can lead to increased risk-taking [3, 17]. This is based on the argument that shareholders of banks benefit from increased risk-taking [3, 17]. These authors explain that having more financial expertise avails board members with the opportunity to

appraise risky policies that may favour shareholders. In this respect, having more financial experts can encourage excessive bank risk-taking. Moreover, Apergis [17] maintains that, appointing more financial experts may encourage excessive risk-taking because a more financially knowledgeable board having a better understanding of complex investments may encourage senior managers to increase their risk-taking.

In line with the inconsistency in the theoretical literature on the expected impact of independent financial experts on bank risk-taking, previous studies have similarly offered mixed empirical evidence. The first strand of studies has reported a negative impact of independent financial experts on bank risk-taking. For example, Garcia-Sanchez et al. [59] document that independent financial experts on the board is associated with less bank risk-taking. Their evidence was based on an international sample of 159 banks from 2004 to 2010.

Another strand of the banking literature has also found a positive effect of independent financial experts on bank risk-taking [17, 89, 90]. Apergis [17] in a sample of 41 banks in the UK from 2001 to 2016 finds a positive association between financial expertise and credit risk. The author concludes that, financial experts contribute to higher risks in the UK banks. Again, Minton et al. [90] examine the impact of independent financial experts on risk-taking in a sample of banks that varies from 182 banks in 2003 to 119 in 2008, with a maximum of 206 banks in 2005 in the US. Their evidence suggests that financial expertise among independent directors in the US banks is positively associated with balance-sheet and market-based measures of risk in the run-up to the 2007-2008 global crisis. Similarly, Minton et al. [89] examine the effect of independent financial experts on risk-taking in a sample that varies from 252 banks in 2003 to 193 in 2008, with a maximum of 322 banks, observe that financial experts are associated with more risk-taking.

In a developing country context, the effect of financial experts on bank risk-taking has not been explored. Meanwhile, most developing countries, including the SSA region, have adopted a set of CG guidelines that have been inspired by the OECD's CG principles (e.g., Kenya CG code 2014; Nigeria CG code 2011). These codes place greater emphasis on issues relating to corporate board composition such as the appointment of independent financial experts in reducing risk-taking. Accordingly, based on the above arguments, independent financial experts in the region may be beneficial in terms of curbing excessive risk-taking.

Thus, the first hypothesis (H1) is stated as follows:

H1: Board independent financial expert(EXPERT) is negatively related to bank risk-taking.

Board meetings and bank risk-taking

Board meeting is considered to be a key attribute that may influence the effectiveness of corporate board [118]. Agency theory predicts that without effective monitoring by the board, managers will behave in ways inconsistent with the interests of the shareholders and other stakeholders. In this case, the board is expected to monitor risk-taking to ensure is consistent with stakeholders' risk preferences. Discernibly, one key dimension of board oversight is the intensity of board activity, which encompasses the number of board meetings [29]. Accordingly, agency and stakeholder theories recommend that the board of banks should meet regularly in order to align the interest of stakeholders and managers, with focus on mitigating excessive risk-taking.

Moreover, evidence of prior research suggests that regular board meetings offer directors the platform to deliberate on key risk-taking decisions [47, 124]. This has the potential of resolving agency conflicts because of a greater information flow within the board resulting in apparently fewer extreme decisions [47]. For example, overconfident managers may pursue

bank policies that can be excessively risky or value destroying [72]. Such unhealthy risk-taking may not serve the interest of shareholders; however, this can be limited by effectively monitoring managers through frequent board meetings [124]. Similarly, past evidence observes that a board that meets more often can respond and address key banking issues such as investment decisions, thereby influencing risk-taking.

The empirical findings are consistent with the theoretical framework of agency theory that board meetings can increase board effectiveness, which can help the board to limit excessive risk-taking [18, 20, 47, 83]. For instance, Liang et al. [83] in a sample 50 Chinese banks from 2003 to 2010 document that the number of board meetings improve the quality of loan portfolio. They conclude that, banks with increased monitoring through frequent board meetings exhibit lower loan default and less risk-taking. Likewise, Dong et al. [47] find that frequent board meetings reduce risk-taking in the Chinese banking system. Their sample contained 105 commercial banks in China from 2003 to 2011. Battaglia and Gallo [20] also examine the link between number of board meetings and risk-taking in Europe from 2006 to 2010. Based on a sample of 40 banks in Europe, they establish a negative relationship between number of board meetings and risk-taking. Similarly, Ayadi and Boujèlbène [18] document a negative relationship between the number of board meetings and risk-taking in 30 European banks over the period of 2004-2009.

With reference to SSA banks, literature examining the association between number of board meetings and risk-taking is rare, and hence, this research establishes a timely contribution to the existing banking studies. Notably, the Combined CG Code issued in the SSA countries recommend that the board of the banks should meet regularly to deliberate on key corporate decisions including risk-taking. Again, the expectation of the Combined CG Code is that when the board of banks have regular meetings, the monitoring role of the board will increase which in turn can curb excessive risk-taking. Given the weak institutional framework in the region, it

is expected that frequent board meetings can limit managers from engaging in excessive risk-taking. Hence, the study formulates the second hypothesis (H2) as follows:

H2: The number of board meetings (NBMs) is negatively related to bank risk-taking

Institutional ownership and bank risk-taking

Institutional ownership relates to the stock market investments of institutional investors [4, 40]. Agency theory suggests that institutional shareholders are influential stakeholders who tend to have additional motivation in terms of monitoring of opportunistic behaviour of managers [101]. In the SSA region, institutional investors have large equity stakes in the banking sectors [15]. Prominently, these institutional owners have some advantages over individual or less informed shareholders [52]. Such advantages include easy access to information, knowledge, skills, and greater external networks [102]. These resources empower them to exert greater effect on key decisions of the board including bank risk-taking.

Agency theory argues that institutional shareholders have a much greater motivation to monitor senior managers to safeguard their investment [10]. This is particularly important in banking industry where exit may be costly to institutional shareholders [10]. In this case, institutional shareholders can limit agency problems by imposing their risk preferences on managers. This can help in aligning managers and shareholders' risk preferences, thereby preventing excessive risk-taking. In addition, stakeholder theory contends that institutional shareholders may monitor banks to ensure risk-taking is aligned with the various stakeholders and not only shareholders. Due to their considerable investment in banks, institutional shareholders tend to be actively involved in the internal governance structures of banks in which they hold significant stake [45]. For example, Boubakri et al. [27] claim that, when institutional investor's stakes increase, there is the tendency for them to join forces with management to safeguard their investments and this may curtail excessive risk-taking.

Alternatively, other scholars argue that institutional investors, may have detrimental effect on bank risk-taking. They maintain that because institutional investors are assumed to be diversified investors, they are largely driven by profitability of their investments regardless of the level of control and as such, a lot of institutional shareholders tend to have high risk attitude [45]. Other scholars consider institutional shareholders as a group of investors who are driven by short-term returns and will not support long-term value creation [12, 66]. Particularly, in banking, transient institutional shareholders are often myopic investors who tend to focus on short-term, hence lack incentives to incur monitoring costs [37]. For instance, Almazan et al. [12] suggest that such short-term investments are mostly risk-prone, and this attitude of institutional shareholders can encourage managers to undertake riskier investments to increase shareholder returns. Diez-Esteban et al. [45] maintain that, by encouraging excessive risk-taking, institutional shareholders can largely be blamed for the collapse of many banks in Southern European countries. Other scholars suggest that because institutional investors have a diversified portfolio of investments, they may have lower incentives to exercise control [19, 53].

Concerning institutional ownership, the empirical evidence is mixed. For example, Garcia'Marco and Robles'Fernandez [58] investigate the effect of ownership structures on risk-taking in Spanish banking sector for the period 1993-2000 in a sample of 258 banks. They observe that institutional bank owners decrease banks' risk-taking. Similarly, Knopf and Teall [77] document that institutional ownership is beneficial as they find an inverse link between institutional ownership and risk-taking in a sample of 2082 banks in the US from 1986 to 1992. Likewise, Ellul and Yerramilli [51] investigation in the US reveal that, banks in the US with substantial institutional investors tend to be cautious in their risk-taking. Their evidence is based on a sample of 100 US banks from 1995 to 2010.

Alternatively, other prior literature also finds a positive association between institutional ownership and bank risk-taking. Fernandes et al. [55] observe that institutional shareholder ownership influence bank risk-taking positively in a sample of 72 publicly listed European banks. Barry et al. [19] establish that institutional ownership increases risk-taking in 17 countries in Europe. They sampled 1791 banks from 1998 to 2011. Ehsan and Javid [48] find that institutional ownership increases risk-taking based on sample of 26 banks from 2000 to 2014. Further, Chou and Lin [37] provide support of a positive link in Taiwan. The authors document a positive relationship between institutional ownership and risk-taking in a sample made up of 37 banks over the period from 2001 to 2006.

The Combined CG code in SSA region is reinforced with prospect that institutional shareholders could possibly play a vital role in augmenting CG mechanisms, including limiting excessive risk-taking behaviour in the banking sectors. However, studies on the association between institutional ownership and risk-taking in SSA region are generally rare. This provides a fertile area for further studies. Notably, institutional stockholders such as public pension funds, mutual funds and insurance corporations are the major players in the SSA banking sector accounting for about 75% stakes in banks [15]. It can be argued that such institutional investors with significant voting power can influence risk-taking through their voting rights by imposing their low-risk preference on managers which might reduce risk-taking. Accordingly, the third hypothesis (H4) of the study is formulated as follows:

H3: Institutional ownership (ISH) is negatively related to bank risk-taking.

Government ownership and bank risk-taking

Government ownership refers to stock investments by state institutions [4]. Across the globe, various governments seek to enhance the quality of sustainable business decisions [40]. Agency theory argues that agency conflicts may intensify with influential owners such as

government [3, 10]. From stakeholder theory purview, government ownership may be a key factor influencing risk-taking, especially in developing countries [46]. Based on resource dependence perspective, government ownership may offer banks with financial and non-financial resources [28]. Financial resources that a bank with government as shareholder may receive include access to government related contracts, tax credit, cheap deposits from governmental agencies and financing [10]. Examples of non-financial resources from the government may be in the form of implicit bailout guarantees when the bank is in distress [10].

Accordingly, the influence of government ownership on risk-taking can be discussed from two main perspectives: development and political views. Pioneered by Gerschenkron [60], the development view suggests that government ownership in banks has two key motives. These are financial development and economic motives. The researcher contends that, these motives totally differ from that of commercial banks operating in most countries. In this case, government ownership is costly as it delivers the opportunity for the government to use its influence to compel the bank to finance projects of the government [28]. Evidently, such projects may be financed regardless of the associated risk [28]. This view suggests that, in banks where governments have substantial ownership, managers may work as agents of government and may encourage increased risk-taking [48].

The political view which was developed by Shleifer and Vishny [111], posits that government holding in banks provides the platform for governments to allocate resources for their political gains. Political motives related challenges with government holding vary from one country to the other. Notable among these challenges from developing countries perspective are offering of employment and financing [111]. Others include granting of incentives to favour politically connected interest groups for the purpose of votes and funding of political parties especially the ruling party [69, 111]. Examples include granting of low-interest loans to businesses that

are pro-government. Such firms are rewarded by politicians for offering them support to stay in power or in return for supporting their political strategy [69].

Additionally, when state-owned bank or in a bank where government has substantial stakes fails, the government will bail out the bank to avoid embarrassment. Such government protection becomes a form of insurance, which creates moral hazard problems through decreased market discipline [69]. In this regard, there is an implied endorsement and shield of the bank's risky projects by government [11], thereby increasing risk-taking [28].

Alternatively, others maintain that if governments attach much importance to social and political objectives with the aim of achieving political stability and employment, then banks with government ownership should pursue less risky investments to reduce the uncertainty of earnings [11, 27]. They contend that, directors appointed by the government may pressure the banks to desist from engaging in risky investments. Under such circumstance, government ownership may lead to less bank risk-taking.

However, evidence on the association between government ownership and risk-taking is inconclusive. Some studies suggest that a government ownership leads to greater risk-taking [39, 67, 68, 81, 88]. For example, Iannottaa et al. [67] observe that government holding in banks reduces the quality of loan portfolio and increases risk-taking in 15 European countries. Their evidence is based on a sample of 181 banks from 1999 to 2004. In developing countries, Lassoued et al. [81] in a sample of 171 banks from MENA (Middle East and North Africa) region during the 2006-2012 period find that government ownership incentivizes banks to engage in excessive risk-taking.

By contrast, others find a negative association between government ownership and risk-taking. Al-Khouri [11], Iannotta et al. [68] and Chan et al. [32] have reported negative findings for samples of Gulf Cooperative Council, European and Chinese banks, respectively. For example,

Iannotta et al. [68] report that, government holding is associated with low loan default risk in a sample of 210 banks in 16 European countries over the period 2000-2009. Chan et al. [32] also document that government ownership contributes to lower risk-taking in China based on 16 banks from 2003 to 2011.

It is argued that, due to the weak institutional framework in the SSA region, government-owned banks may grant credit facility with no economic basis to highly risky sectors of the economy such as agriculture sector. They may offer credit or seldom coerced into making economically questionable credit to friends and relatives of politicians [28, 91]. Accordingly, the study expects government ownership to increase risk-taking behaviour, hence, the study predicts the fourth hypothesis (H4) as follows:

H4: Government ownership (GSH) is positively related to bank risk-taking.

Foreign ownership and bank risk-taking

Foreign ownership refers to stock investments by foreign institutions [4]. Agency theory suggests that the prime origin of conflict between owners of banks and managers emanates from their diverse opinion of risk [81]. It has been stated that shareholders due to their diversified portfolios tend to encourage excessive risk-taking for a higher projected profit [18]. However, managers are conservative in view of safeguarding their positions and individual benefits, and maintaining their attained human capital [81, 71]. From resource dependence theory perspective, the entry of foreign investors into the domestic market could potentially allow the flow of essential resources such as human capital and technology into the domestic bank [81].

Concerning the impact of foreign banks on risk-taking, it has been suggested that foreign banks may experience liabilities of foreignness due to the inherent problems in orienting themselves with the domestic country's' practices [78]. This can lead to higher risks in the banking sector of host country [62]. For example, foreign banks are largely considered as possessing a riskier credit portfolio due to proprietary information challenges [35]. A plausible explanation for this is that local banks may have proprietary information on the creditworthiness of borrowers; however, this may not be same with foreign banks. At least at the early stages of entry, foreign banks may incur high non-performing loans because they may be confronted with a pool of customers with poor credit history [42]. Additionally, subsidiaries may engage in excessive risk-taking in a form of moral hazards [27].

Further, foreign banks may influence risk-taking in the host country directly through risk-shifting approach [27]. This is mainly achieved through restructuring of incentives packages for managers [71]. By offering attractive performance incentives to managers, foreign banks can increase the propensity for managers to take more risk. Arguably, the implementation of restructuring of banks by more risk oriented foreign investors can indirectly lead to a change in risk-taking profile of acquired banks [27].

By contrast, foreign ownership in banks can have several benefits which include foreign financing, better managerial skills, and more innovation in terms of handling potential borrowers [69]. For example, the "global advantage hypothesis" suggests that banks that are owned by foreigners may rely on more advanced technologies in their credit appraisal process [82]. Such banks may have as better screening technologies, highly skilled employees, and improved corporate practices [3, 82]. Debatably, such superior screening technologies can serve as powerful tools which can help reduce potential liabilities of foreignness as well as have better risk controls, which may lower risk-taking behaviour [35, 62, 69].

Previous studies have similarly offered mixed empirical evidence. Some prior studies document a positive effect of foreign ownership on bank risk-taking [24, 35, 48, 62, 81, 123]. For example, using 1300 banks in 32 emerging economies from 2000 to 2013, the findings of Chen et al. [35] reveal that, banks owned by foreign investors engage in more risk-taking than their local counterpart.

By contrast, other studies provide evidence that foreign ownership reduces risk-taking. Haque [62] report that banks owned by foreigners take less risk in the MENA region based on 144 banks from 2001 to 2012. Lassoued et al. [81] also examine the same link with 171 banks in the MENA region covering the period of 2006-2012. They document that foreign ownership in banks in the region decreases risk-taking. Ehsan and Javid [48] also observe an inverse link between foreign banks and risk-taking in 26 banks in Pakistan over the period 2000-2014. Boateng et al. [24] reveal that foreign banks have fewer NPLs in a sample of 88 banks in China covering the period 2003-2014.

Research examining the effect of foreign ownership on risk-taking in a cross-country sample is uncommon in SSA region. Nevertheless, prior research based on single country evidence or selected countries in the region suggests that foreign ownership impact positively on risk-taking [25, 105]. In line with the evidence of a few empirical studies in emerging economies, which suggest a positive link between foreign ownership and risk-taking, the study predicts the fifth hypothesis (H5) as follows:

H5: Foreign ownership is positively related to bank risk-taking.

Data, methodology and descriptive statistics

Data sources and sample selection

The dataset covers 220 banks from 16 Sub-Saharan Africa countries over the period of 2007-2018. These countries are Botswana, Gambia, Ghana, Kenya, Lesotho, Liberia, Malawi,

Mauritius, Namibia, Nigeria, Sierra Leone, South Africa, Tanzania, Uganda, Zambia, and Zimbabwe. These countries were primarily chosen because they have a common official language which is English. In line with similar past CG studies [25, 105], this helps in collection of data from the sampled banks by eliminating language barriers as the CG characteristics were hand collected. The choice of the countries also partly emanates from the similar CG reforms implemented across the countries over the past two decades.

The CG variables (i.e., board attributes and ownership structures) were collected from the sampled bank's annual reports which were sourced from the website of the banks. Table A1 in the appendix provides example of websites of the banks in the Sub-Saharan Africa countries. Bank financial data was collected from BankScope, and supplemented with those from annual reports, where necessary. The country-level data, including GDP, was collected from the website of the World Bank, while inflation came from the International Monetary Fund's website. The study sample period starts in 2007 and ends in 2018. In line with prior CG studies, the selected period of the study covers both pre-and post-2010 [110]. Noticeably, the sample timeframe spans over the pre-, during and post CG reforms period in the SSA countries. This helps in assessing whether the CG reforms have helped in improving CG standards particularly with regards to influencing bank risk-taking behaviour in the region. Further, most of the banks' annual reports became publicly accessible on their websites in 2007. This made it possible to collect data from 2007 in all the 16 countries. The sample period ends in 2018, as it was the most recent year for which data was available for the sampled banks. Table 1 provides the final dataset which includes 220 banks with 2027 bank-year observations.

[Insert table 1 about here]

Following the convention in banking literature, the study excluded banks with missing data or whose annual reports were not published [3, 93]. Consistent with previous studies [9], the study excluded foreign-owned banks that published their annual reports worldwide as

consolidated financial statements. Also, the study sampled banks and specialized financial institutions whose nature and operations are like that of commercial banks. This was done to ensure uniformity in the sampled banks as done in previous studies in the SSA countries [9, 93].

Definitions of variables and empirical specification

Table 2 presents summary definitions of the dependent, independent and control variables employed in this study.

Dependent variable

Following prior banking studies [21, 94, 95], Z-score is chosen as bank risk-taking measure. Based on well-established studies [21, 44, 94, 95], the Z-score for the sampled banks is calculated as follows:

$$\text{Z-score}_{it} = \frac{\text{ROA}i,t - \text{EA}i,t}{\sigma\text{ROA}i,t} \quad [1]$$

Where $ROA_{i,t}$ represents return on asset for a bank i at time t, $EA_{i,t}$ is the equity to total assets ratio for bank i at time t, $\sigma ROA_{i,t}$ denote is the standard deviation of return on assets of bank i at a time t.

As a robustness check, the study employs non-performing loans (NPLs) and loan-loss provision (LPROV), as alternative measures of bank risk-taking. In line with Chen and Lin [34] and Eibannan [50], NPLs is defined as bank ratio of non-performing loans to total loans in a financial year with a larger value indicating a riskier credit portfolio. Similarly, and consistent with Mustapha and Toci [95] and Al-Khouri [11], LPROV denotes the ratio of loan loss provision to total loans in a financial year.

Independent variables

The study employs two main independent variables. The first set of independent variables are the board attributes, measured by employing independent financial experts and number of board meetings. Following Apergis [17] and Minton et al. [90], independent financial expert is measured by the percentage of independent financial experts on the board. Similar to Minton et al. [90] and G¨uner et al. [57], an independent director is categorised as a financial expert if he or she i) has held an executive position at a banking institution (former bank executive), ii) holds an executive position at a nonbank financial institution (Executive of nonbank financials), iii) holds a finance-related position (e.g., chief financial officer (CFO), accountant, treasurer, vice president (VP) finance) of a nonfinancial firm (Finance executive of non-financials), iv) holds an academic position in a related field (e.g., Professor of finance, economics, or accounting), or v) works as a hedge fund or private equity fund manager, or venture capitalist (Professional investor). In applying the above definition, we did not consider all non-executives directors as independent. It is common practice for a director to sit on the board of both the parent bank holding company and one of its subsidiaries Minton et al. [90]. Consequently, we do not consider a current executive working at a subsidiary of the bank to be an independent financial expert at the bank holding company level as applied by Minton et al. [90]. Our financial expertise variable is assessed as the fraction of reported independent directors in the annual report of the bank who are classified as financial experts according to our definition.

Number of board meetings (NBMs) is measured by the natural logarithm of the total number of board meetings in a year [20]. The second set of independent variables are the ownership variables. Institutional ownership is measured by the percentage of shared owned by institutions in the banks [48]. Government ownership is proxied by the percent of shared owned

by government in the banks [32], whilst foreign ownership represents the percentage of shares owned by foreigners [81].

Control variables

Consistent with previous studies [17, 92,110, 125], this study controls for possible omitted variables bias by including a number of control variables. The study controls for CG mechanisms that have been examined in previous studies: board characteristics (e.g., board size and board gender diversity). The study also controls for firm-level variables that could be related to bank's outcome such as firm size, capitalization, liquidity, leverage, age and audit firm size, deposit; and country-level variables such as GDP and inflation [3, 5, 9, 110]. Finally, some scholars maintain that bank risk-taking may be affected by country and time [5, 125]. Therefore, study includes country dummies (CDU) for the sixteen countries: and year dummies (YDU) for the financial years from 2007 to 2018. Details of the variables are provided in Table 2.

[Insert table 2 about here]

Empirical specification

To examine the effect of board attributes and ownership characteristics on risk-taking, the study follows Zhou et al. [125] model and adds to it the ownership variables, as well as the control variables as expressed as follows:

$$BRT_{it} = \alpha_0 + \beta_1 InEXPERT_{it} + \beta_2 InNBMs_{it} + \beta_3 InISH_{it} + \beta_4 InGSH_{it} + \beta_5 InFSH_{it} + \beta_6 CONTROLS_{it} + \varepsilon_{it} \quad [2]$$

Where: BRT is the dependent variable measured using Z-score, non-performing loans (NPLs) and loan loss provision (LPROV); EXPERT (independent financial experts), NBMs (number of board meetings), ISH (institutional ownership), GSH (government ownership), FSH (foreign

ownership), are the main independent variables; and CONTROLS denotes the set of variables being controlled for, including, CEO-Chair separation (SEPARATION), board size (BSIZE), board gender diversity (BDIVG), firm size (FSIZ), capitalization (CAP), age (AGE), liquidity (LIQ), audit firm size (BIG4), deposit (DEP), GDP, inflation (INFL), country (CDU) and year (YDU) dummies.

Descriptive Statistics

Table 3 provides descriptive statistics of the study's dependent, independent and control variables. Panel A reveals a wide variation of different measures of corporate outcomes. For example, in line with previous research [25, 105], the average Z-score, is 0.610, with a minimum of 0.030 and a maximum of 2.42. Non-performing loans (NPLs) ranges from 0 to 68.00, with an average (standard deviation) of 5.17 (9.07), whilst loan loss provision (LPROV), it ranges from 0 to 37.00 with an average (standard deviation) of 1.52 (3.26).

Furthermore, Panel B shows that independent directors who are financial experts (EXPERT) ranges from 10.00% to 88.83% and has a mean (standard deviation) of 58.23% (14.77). The average EXPERT is slightly higher than the 21% reported by Apergis [17] in the UK banking sector from 2001 to 2016. The average NBMs records a minimum of 2.00, maximum of 12.00, a mean of 4.98 and standard deviation of 1.46. Similarly, this demonstrates that the NBMs is highly varied among banks in the SSA countries.

Panel C illustrates that institutional ownership (ISH) has widespread variation ranging from 11.78% to 100% and averaging of 75.54%. The evidence suggests that ISH holds a large fraction of stakes in banks in the SSA region. With regard to government ownership (GSH) and foreign ownership (FSH), the results range from 0% to 100%, with an average of 5.46% and 17.62%, respectively. The evidence in the table also shows that some banks in the region

were 100% owned by government. Overall, bank ownership figures are largely in line with findings reported in the banking system of the SSA countries [15, 25, 105].

[Insert table 3 about here]

Also, the descriptive statistics for the bank control variables are illustrated in panel D. The CEO-Chair separation (SEPARATION) variable has a mean value of 1 and varies between 0 and 1. Board size (BSIZE) with an average of 9 board members ranges between a minimum of 4 and a maximum of 12. In addition, board gender diversity (BDIVG) has an average of 24.79% and ranges between a minimum of 0% and a maximum of 83.33%. Likewise, the summary statistics for the other bank and country control variables, which are illustrated in Panels D and E, respectively, display wide variation.

Table 4 presents the correlation coefficients of Pearson matrix among the dependent, independent and control variables. This analysis was carried out to detect if there is any serious probable multicollinearity challenges. It has been suggested that an absolute correlation of 0.7 or above will infer the presence of multicollinearity issue [84]. The findings captured in Table 4 reveal that all the correlation coefficients have absolute values that are less than 0.7. This evidence confirms the absence of any major multicollinearity issues [84]. The findings show that, the board attributes are negatively associated with the bank risk-taking variables. For instance, EXPERT has a negative and significant correlation with Z-score, NPLs, and LPROV. The table suggests significant correlation between the ownership structures and bank risk-taking variables. For example, ISH has negative and significant correlation with all of the bank risk-taking measures. In general, the results of the correlation matrix suggest that different CG measures have a significant impact on various bank risk-taking measures.

[Insert table 4 about here]

Empirical results

The study present the results of the ordinary least squares estimations to test the relationship between CG variables and bank risk-taking in Table 5. In all specifications, the study includes all the control variables as well as year-fixed effect, and country-fixed effect. More precisely, the table provides the findings concerning the impact of board and ownership mechanisms on risk-taking indicating Z-score, non-performing loans (NPLs), and loan loss provision (LPROV) as the dependent variables. Previous research proposes that independent financial experts (EXPERT*)* may enhance the monitoring capacity of the board [71, 102]. This can contribute towards reducing agency conflicts and thus prevent excessive risk-taking [17, 71, 90]. To test this, the study examines the impact of EXPERT on bank risk-taking. First, the estimated results in Model 1 of Table 5 show that EXPERT has a negative association with the Z-score (-0.008, $p < 0.001$); thus, H1 is empirically supported. The economic implication of this evidence is that a one standard deviation increase (decrease) in EXPERT will be associated with about a 0.118 (0.008*14.77) decrease (increase) in the Z-score. Next, as predicted by this study, the results in Model 2 of Table 5 show that EXEPRT is negatively related to NPLs (-0.002, $p < 0.05$); thus, H1 is empirically supported. Economically, the evidence implies that a one standard deviation increase (decrease) in the percentage of EXPERT will be associated with about a 0.030 (0.002*14.77) increase (decrease) in the NPLs. Moving on, the results in Model 3 of Table 5 demonstrate that EXPERT exerts a negative impact on the LPROV (-0.006, $p < 0.05$); hence, H1 is empirically supported. The economic implication of this evidence is that a one standard deviation increase (decrease) in EXPERT will be associated with about a 0.089 (0.006*14.77) decrease (increase) in the LPROV. Overall, the findings provide empirical support for H1.

The evidence suggests that EXPERT serving on the board is a crucial governance tool that can augment the monitoring role of the board and help reduce bank risk-taking. The evidence is

consistent with the theoretical prediction of agency theory that EXPERT have appreciable knowledge and understanding of banking transactions which can lead to better oversight and mitigate excessive risk-taking [59]. The finding is also supported by resource dependence theory that suggests that banks can benefit from the expertise of EXPERT in terms of early spotting of risk and preferring of risk-mitigation solutions. Stakeholder theory suggests that the presence of EXPERT is essential in terms of protecting stakeholders' rights. Independent financial experts also provide expertise, knowledge and opinions that improve decision making effectiveness and hence reduces risk-taking. The result corroborates empirical findings of prior studies which suggest EXPERT encourage managers to take less risk [59], but in differ from studies that document positive association between EXPERT and bank risk-taking [17, 89, 90].

Second, the regression results in Models 1 to 3 in Table 5 test the impact of number of board meetings (NBMs) on risk-taking (Z-score, NPLs and LPROV) the banks. The findings in Table 5 point to the evidence that, NBMs has a negative and statistically significant influence on the Z-score, NPLs and LPROV. Precisely, NBMs is negatively (see Model 1) associated with the Z-score (-0.330, $p < 0.001$), strongly providing empirical support for H2. Economically, the evidence is significant because it suggests that a one-standard deviation increase (decrease) in NBMs will be associated with about a 0.482 (0.330*1.46) increase (decrease) in the Z-score. The results in Model 2 of Table 5 also reveal that NBMs has negative impact on the LPROV (-0.042, $p < 0.10$), thereby providing empirical support to H2. The economic implication of this evidence is that a one standard deviation increase (decrease) in NBMs will be associated with about a 0.061 (0.042*1.46) decrease (increase) in the NPLs. Further, NBMs shows a strong negative relationship with the LPROV (-0.750, $p < 0.001$), thus implying that H2 is empirically supported. The finding suggests that a one standard deviation increase (decrease) in NBMs will be associated with about a 1.095 (0.750*1.46) increase (decrease) in the LPROV-

implying that the evidence is economically significant. Together, these findings offer support for H2. From agency theory perspective, as board meeting increases, the monitoring activity of the board increases which translate into effective supervision and coordination, thereby limiting the scope of excessive risk-taking by managers. In addition, regular board meetings can enable the board to provide strategic advice on key investment decisions, as well as help identify valuable investment opportunities which can reduce risk-taking. The evidence confirms the findings of previous research that observe a negative link between NBMs and risk-taking [20, 47, 83].

[Insert table 5 about here]

Third, Table 5 also provides the findings of the ownership variables on risk-taking in the SSA countries. The results in the table show that institutional ownership (ISH) has a negative effect on the Z-score (-0.007, $p < 0.001$); hence, H3 is empirically supported. The economic implication of this result is that a one standard deviation increase (decrease) in ISH will be associated with about a 0.129 (0.007*18.51) decrease (increase) in the Z-score. In addition, ISH is negatively associated with the NPLs (-0.004, $p < 0.001$). Economically, the result is significant because it suggests that a one-standard deviation increase (decrease) in ISH will be associated with about a 0.074 (0.004*18.51) increase (decrease) in the NPLs. These findings support H3 and in line with agency and stakeholder theories. For example, agency theory explains these findings by suggesting that institutional shareholders are better at monitoring managers from engaging in excessive risk-taking [48]. In addition, stakeholder theory also predicts that when institutional investor's stakes increase, there is the tendency for them to join forces with management to safeguard their investments and this may curtail excessive risk-taking [27]. The findings confirm the evidence of prior studies that document negative relationship between institutional ownership and risk-taking [51, 58, 77]. Evidently, although

ISH has a negative association with LPROV in Model 3, the relationship is statistically insignificant.

Fourth, Table 5 reports the regression results of the effect of government ownership (GSH) on the bank risk-taking variables. The results show that GSH has positive effect on the Z-score (0.005, $p < 0.10$). This provides empirical support for H4. The economic significance of this result is that a one standard deviation increase (decrease) in GSH will be associated with about a 0.100 (0.005*20.08) decrease (increase) in the Z-score. Furthermore, the results in the table reveal that GSH has positive effect on NPLs (0.009, $p < 0.001$). The economic significance of this evidence is that a one standard deviation increase (decrease) in GSH will be associated with about a 0.181 (0.009*20.08) decrease (increase) in NPLs. These results partly support H4 which posits that governments in SSA countries encourage banks to take more risk. These findings are consistent with the theoretical prediction of agency theory that, banks with substantial government ownership engage in excessive risk-taking. This is because, it allows government to finance risky and non-profitable projects aimed at ensuring the government re-election and political tenure [27]. The finding also corroborates evidence of previous studies that document positive associations between government ownership and risk-taking [37, 67, 88, 116]. The results reported in Models 3 of Table 5 indicate that GSH has an insignificant impact on LPROV.

Fifth, the results in Table 5 show that foreign ownership (FSH) has positive impact on the Z-score (0.006, $p < 0.001$). This evidence indicates that H5 is empirically supported. The finding suggests that a one standard deviation increase (decrease) in FSH will be associated with about a 0.047 (0.006*7.77) increase (decrease) in the Z-score-suggesting that the evidence is economically significant. In addition, the results in Table 5 also shows that FSH has a positive effect on the NPLs (0.004, $p < 0.001$); hence, H5 is empirically supported. The economic significance of this result is that a one standard deviation increase (decrease) in FSH will be

associated with about a 0.031 (0.004*7.77) decrease (increase) in the NPLs. Overall, these findings provide empirical support for H5. The positive association is also supported by agency theory, which suggests that foreign banks encounter liabilities of foreignness because of inherent difficulties in recognizing and accustoming to the domestic country regulations and procedures [78]. This difficulty is even heightened in emerging economies, such as SSA, where there is virtually no reliable credit history of borrowers [8]. These results also confirm the theoretical proposition of agency theory notion that foreign investors directly increase risk-taking through risk-shifting approach [27, 71]. Nevertheless, the result in Model 3 shows that, FSH has positive but insignificant association with LPROV.

Finally, concerning the control variables, the results in Models 1-3 of Table 5 show that CEO-Chair separation (SEPARATION) has negative but insignificant impact on all the bank risk-taking measures (Z-score, NPLs and LPROV). Further, board size (BSIZE) has positive effect on Z-score and NPLs, in Models 1 and 2, respectively. The results reported in Models 1 to 3 of the table indicate that board diversity measured on the basis of gender (BDIVG) has an insignificant impact on all the bank risk-taking in the SSA banks. Generally, banks in the region have low representation of female directors on their boards. This can partly explain the insignificant relationship between BDIVG and risk-taking in the SSA banks. The findings of the other control variables are largely consistent with the predicted signs. For example, firm size has negative impact on risk-taking which suggests that large banks tend to have low risk-taking behaviour. The evidence supports Delis [32] suggestion that large banks have access to low-cost capital owing to lower information asymmetries and superior risk-management capacities. For instance, larger banks have lower NPLs, it seems stronger financial position and better managerial ability in large banks play a role in mitigating risk-taking behaviour in SSA region. Contrary to the prediction of the study, bank age seems to be positively associated with the risk-taking measures, suggesting that older banks engage in more risk-taking than younger

banks. This does not support the “older bank hypothesis” that older banks are safer because they have good lending relationships with their customers.

Additionally, the findings reveal that liquidity has a linear relationship with all the risk-taking measures in the SSA banks. This indicates that liquid banks tend to increase risk-taking due to the greater opportunities for them to increase the size of their market share. The evidence does not support the findings of Mustapha and Toci [95] that liquid banks charge low interest rates on loans, which tend to attract less risky projects and hence low default rate. The coefficient of capitalization is negative but insignificant in all the Models except in the Model 2 where the association is significant. This imply that that well-capitalized banks are associated with reduced risk-taking in the region. This supports the evidence of Mustapha and Toci [95] who report that banks with high capitalization tend to engage in less risk-taking. The risk-taking behaviour in the banking system is considerably dependent on the amount of equity holdings by the banks [3, 95]. Banks with high capital ratio tend to be conservative in risk-taking as a way of preserving shareholders value [95].

Also, except for loan-loss provision (Model 3), audit firm size results produce a negative and significant relationship with the risk measures in the SSA region’s banks. Deposit has positive but insignificant associations with the risk-taking measures except in Model 1 (Z-score) where the relationship is significant. Consistent with the findings of Akande et al. [4], the results in the table show that both GDP and inflation have influence on the risk-taking behaviour of banks in the SSA region. For example, GDP produces a positive and significant relationship with NPLs, but an inverse link with the Z-score. Similarly, the relationship for inflation shows that, it has positive and significant impact on *Z*-score and LPROV in Models 1 and 3, respectively.

Additional analyses

The prior literature suggests that the association between CG and bank risk-taking relationship can be heavily influenced by regulatory frameworks and competing interest of various institutional investors [e.g., 2, 30, 75; 76]. In this case, it is vital to focus on variations in the regulatory and varying institutional ownership influence when assessing the impact of CG variables on bank risk-taking [2, 4, 30]. Hence, we perform a two additional analyses.

First, since 2012, most of the countries in the SSA region have been adopting CG codes of best practice. The expectation of CG reforms that have been pursued in the region is that internal governance mechanisms such as EXPERT, NBMs and bank ownership will have beneficial impact on corporate outcome such as bank risk-taking [2]. To assess the effect of the CG reforms on these relationships, we divide the sample into two, pre-CG reforms and post-CG reforms. We estimate Equation (1) for two subsamples, namely pre-CG reforms (2007-2013) and post-CG reforms (2014-2018), to consider the effects of CG reforms on the relationship between the CG variables and bank risk-taking. The results in Table 6 show that EXPERT and NBMs have positive and significant impact on bank risk-taking measures (Z-score, NPLs and LPROV) in the post reforms sub-samples, but no association in the pre-CG reforms sub-samples.

Next, the results in Table 6 reveal that ISH has negative and significant relationship on the bank risk-taking variables (Z-score, NPLs and LPROV) in both post-CG reforms and pre-CG reforms sub-samples. The negative impact of ISH on the bank risk-taking variables are more pronounced in the post-CG reforms sub-samples. Further, Table 6 shows a significantly positive association between GSH and bank risk-taking variables (Z-score and NPLs) in the post-CG sub-samples, and no association in the pre-CG reforms subsamples. The positive effect of GSH on the bank risk-taking variables are also lower in the post-CG reforms sub-

samples than the main samples. In addition, Table 6 shows a significantly positive association between FSH and bank risk-taking variables (Z-score and NPLs) in the post-CG sub-samples, and no association in the pre-CG reforms sub-samples. The positive effect of FSH on the bank risk-taking variables are also lower in the post-CG reforms sub-samples than the main samples. Overall, these results highlight the importance of CG reforms/ initiatives in lowering risk-taking in the banking sector in the SSA region.

Insert Table 6 about here

Second, existing empirical literature shows that institutional investors such as pension funds and insurance firms may be more long-term oriented [30, 75, 76], and hence may encourage managers of banks to engage in less risky investments leading to a decrease in bank risk-taking [2]. By contrast, other scholars maintain that not all institutional investors can be expected to monitor long-term investments [3, 30]. In this regards, short-term institutional investors such as mutual funds may be more focused on the short-term profit and thus encourage banks to engage in investments with high return in the short-term which can increase bank risk-taking. Accordingly, we estimate whether the predicted relationships differ across various diverse institutional investors including public pension fund institutional ownership (PENSION FUNDS_ ISH), insurance firms' institutional ownership (INSURANCE FRIMS_ ISH) and mutual funds institutional ownership (MUTUAL FUNDS_ISH). The results in Models 1-3 of Table 7 reveal that the negative impact of PENSION FUNDS_ ISH on the bank risk-taking variables (Z-score, NPLs and LPROV) is greater than the main results in Table 5, indicating that public pension funds institutional investors are associated with lower risk-taking in the SSA banks. This evidence suggests that banks with substantial long-term institutional investors may curb excessive risk-taking [3, 30]. Further, the estimated results in Table 7 reveal that INSURANCE FRIMS_ ISH is negatively related to the bank risk-taking variables (Z-score, NPLs and LPROV), indicating that the negative impact of institutional ownership on bank risk-

taking is stronger for banks with a high insurance firms' ownership. The implication is that banks with substantial insurance firms' institutional ownership tend to have a low risk-taking. Altogether, the results suggest that SSA banks with long-term oriented institutional investors are associated with lower risk-taking. Our findings corroborate the suggestions that, pension fund investors in the SSA region have low risk preference due to the long-term nature of their commitment to their clients (pensioners). In this regard, such dominant institutional investors with substantial voting power can mitigate excessive risk-taking by imposing their low-risk preference on senior managers. Moreover, there is the tendency for such institutional investors to join forces to effectively monitor managers and limit excessive risk-taking in the SSA region.

By contrast, the results in Table 7 shows that MUTUAL FUNDS_ISH is positively and significantly related to Z-score, indicating that banks with substantial mutual funds institutional ownership is associated with increased risk-taking. Although MUTUAL FUNDS_ISH has positive impact on NPLs and LPROV, the relationship is insignificant. Overall, the findings suggest that the impact of institutional ownership on bank risk-taking vary across the diverse institutional investors.

Insert Table 7 about here

Robustness Checks

The study conducts a number of additional analyses in order to test the robustness of the findings. First, it is possible that the relationships that our study reports between the CG variables and bank risk-taking are being driven by reverse causality or by latent variable [72]. Notably, previous scholars [6, 7, 36, 72], address such endogeneity concern by employing a two-stage least squares (2SLS) approach, and so our study adopts their approach. Prior studies used lagged one-year lagged levels of the CG variables as primary instruments [36]. Similarly, our study proposes that lagged CG variables could be appropriate instruments for the

endogenous CG variables. The result for the 2SLS estimation is presented in Table 8. For each of the models, the Hausman endogeneity test is employed to ascertain the appropriateness of using the 2SLS approach. The results of the Hausman endogeneity test confirm that the CG variables in all the three models are endogenous. This evidence supports the use of 2SLS technique in the robust analysis with lagged of the CG variables as instruments consistent with previous research [36, 86].

The results reported in Models 1 to 3 of Table 8 show that, the 2SLS findings are consistent with those reported findings in Table 5. For example, in line with earlier findings, the results in Table 8 show that EXPERT has negative and significant effect on Z-score, NPLs and LPROV. In line with the OLS results, the table shows that NBMs has an inverse relationship with Z-score, NPLs and LPROV.

[Insert table 8 about here]

In respect of ownership variables, Table 8 shows a negative relation between ISH and three of the bank risk-taking measures (Z-score and NPLs) in Models 1 and 2, respectively, thus confirming the findings of the OLS results in Table 5. Findings in relation to government ownership also suggest GSH is positively associated with Z-score and NPLs in Models 1 and 2, respectively, in line with the earlier findings. The analysis reported in Table 8 also reveal a positive foreign ownership effect on all the risk-taking measures across the Models except in Model 3.

Additionally, it has been suggested that it is possible to have a time lag between the possible impact of CG variables on the risk-taking of banks [15]. In this case, the current years' CG may be associated with the following years' bank risk-taking. This is because the benefits of CG initiatives may not materialise immediately. To test simultaneity problems that may arise

due to the presence of a lagged CG and risk-taking nexus, the study follows Ntim and Soobaroyen [100], to re-estimate Eq. (2) as a lagged structure as specified below:

$$BRT_{it} = \alpha_0 + \beta_1 InEXPERT_{it-1} + \beta_2 InNBMs_{it-1} + \beta_3 InISH_{it-1} + \beta_4 InGSH_{it-1} + \beta_5 InFSH_{it-1} + \beta_6 CONTROLS_{it-1} \quad [3]$$

where everything remains the same as specified in Eq. (2) except that the study includes a one-year between the risk-taking measures on the left side of the equation and, CG variables and other control variables on the right side of the equation. Thus, the current years' risk-taking of banks depends on previous years' CG variables. The findings reported in Models 1 to 3 of Table 9 are consistent with the evidence in Table 5, thus suggesting that the findings are largely robust when estimating a lagged CG and bank risk-taking structure.

[Insert table 9 about here]

Finally, the study estimated a dynamic two-step system generalized method of moments (GMM), as proposed by Blundell and Bond [23], which for brevity not reported, but will be available upon request. Overall, the additional analyses indicate that the results of the study are fairly robust to alternative checks.

Conclusions

Although several prior studies have investigated the extent to which board and ownership mechanisms affect bank risk-taking in different regions and countries, insights from the Sub-Saharan Africa (SSA) region is under-researched. More importantly, despite the importance of recent CG reforms across the countries in the SSA region which seek to curtail excessive risk-taking in the banking sectors, empirical cross-country studies investigating the effects of board and ownership mechanisms on bank risk-taking is scarce.

Consequently, this study focused on examining the effect of board attributes and ownership structures on bank risk-taking in SSA region. Accordingly, the study contributes to the banking literature by determining whether: (i) independent financial experts as measured by number of independent directors who are financial experts on the board and number of board meetings affect bank risk-taking; and (ii) ownership structures as measured by institutional ownership, government ownership, and foreign ownership influence bank risk-taking in the SSA countries. The study detects a negative and significant influence of independent financial experts on risk-taking. Second, the evidence shows that regular board meeting can limit excessive bank risk-taking. Third, the study finds empirical evidence that shows that institutional ownership is associated with less bank risk-taking. Furthermore, we observe that long-term institutional investors such as public pension funds and insurance firms' ownership in the SSA banking sector tend to reduce risk-taking. By contrast, the evidence of our study reveals that short-term institutional investors such as mutual funds ownership is associated with increased bank risk-taking. Fourth, the study documents a positive and significant relationship between government ownership and risk-taking. Fifth, the evidence shows that foreign shareholders increase bank risk-taking behaviour in the SSA countries. Finally, our results also show that the predicted associations vary across different periods.

The study contributes to the literature on board attributes, ownership structures and bank risk-taking. Specifically, study makes three main contributions to the extant literature by drawing on insights from agency, stakeholder, and resource dependence theories. First, although several studies have investigated the impact of corporate governance variables on risk-taking [1, 73, 96, 113], a limited number have investigated the association between independent financial experts and bank risk-taking [e.g., 17, 90]. This research evidence sheds light on the impact of independent financial experts on different aspects of bank risk-taking, including Z-score, non-performing loans (NPLs*)* and loan loss provision (LPROV).

Second, the research offers new critical insights on the impact of board meetings on different measures of risk-taking (Z-score, NPLs, and LPROV). While a number of prior studies have examined the impact of board meetings on different corporate outcomes such as financial performance [13, 33, 99], the results of this study suggest that frequent board meetings can mitigate excessive bank risk-taking. Finally, the study differentiates itself from several prior research investigating the relationship between ownership structures and risk-taking [48, 81], by investigating a sample of banks in SSA countries. In particular, the study sheds new insights on the impact of the three dominant ownership structures (institutional, government and foreign ownership) in the region on three different aspects of risk-taking (Z-score, NPLs and LPROV).

The findings have a number of policy implications. First, the evidence strengthens the case for the appointment of more independent financial experts into corporate boards in the SSA banks. Future CG reforms in the region may focus on establishing criteria for their selection. Second, to enhance board's monitoring ability and its decision-making process, policy makers should encourage frequent board meeting. Third, the findings call for banking regulators to encourage individuals to invest through institutional investors. Similarly, regulators should encourage less government ownership in the banking system by putting in place extensive requirements and restrictions on government ownership in the region. Also, the evidence at the Sub-Saharan Africa cross-country level is relevant to banking practitioners and regulators in other developing countries.

Although the findings are robust, they must be interpreted in light of the following limitations, which may be addressed in future research. First, although we employ a more restrictive definition of independent financial expertise as applied by prior studies, this might not capture "truly independent financial experts" as due to data limitation in the SSA banking sector, we could not identify independent directors who might have "external ties" with the CEO, and/or represent certain shareholders, family members of executives, or have any business dealings

with the bank. Second, we analyse board attributes and ownership structure indicators reported by the sampled banks. In this regard, future studies might conduct comprehensive interviews with bank executives and board members to provide new insights on bank risk-taking. Third, because the CG variables were manually collected from the annual report, the study could not include all banks in the SSA countries. Hence, future researchers might include more banks which could improve the generalization of the results. Fourth, other CG variables may be examined, this might include, but not limited to, external governance structures as data become accessible in the region. In particular, the existence and composition of certain board sub-committees (auditing, risk and governance) has been reported by extant literature as potentially relevant factors that can explain risk-taking [e.g., 115, 59, 22, 117] as well as the structure of incentive compensation systems for the CEO or other executives [e.g., 65, 56, 61] or the educational level of board members [54]. In this regards, future research may offer additional insights by examining the impact of board sub-committees, pay incentives and educational level of board members on bank risk-taking in the SSA region as more data become available. Finally, future researchers may investigate the effect of independent financial experts on other corporate outcomes, such as sustainable banking practices and corporate disclosures.

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Conflicts of interest/ Competing interests

The author declares no potential conflicts of interest or competing interests with respect to the research, authorship, and/or publication of this article.

Tables

Table 1: Composition of the sample by countries

Country	Bank Population	Sample	Representation (%)
Botswana	10	10	100
Gambia	12	8	67
Ghana	24	24	100
Kenya	41	30	73
Lesotho	4	4	100
Liberia	9	6	67
Malawi	9	5	56
Mauritius	21	15	71
Namibia	8	5	63
Nigeria	20	19	95
Sierra Leone	12	4	33
South Africa	21	20	95
Tanzania	38	25	66
Uganda	25	20	80
Zambia	17	13	76
Zimbabwe	13	12	92
Total	284	220	77

Notes: Population and Sample refer to count, and representation refers to sample as a percentage of population.

Table 2. Definition of variables

Variables	Symbols	Operationalization	Source
Dependent variables			
Z-score	Z-score	Banks' return on assets plus the equity asset ratio divided by the standard deviation of asset returns.	BankScope/Annual report
Non-performing loans	NPLs	The bank-level ratio of non-performing loans to total loans; a larger value indicates a riskier loan portfolio	BankScope/Annual report
loan-loss provision	LPROV	It is measured by the ratio of total loan loss provision of a bank to total loans.	BankScope/Annual report
Corporate governance/Independent variables			
Independent financial experts	EXPERT	Percentage of independent financial experts on the board.	Annual report
Number of board meetings	NBMs	The natural logarithm of the total number of board meetings in a year.	Annual report
Institutional ownership	ISH	The percentage of shared owned by institutions in the banks.	Annual report
Government ownership	GSH	Percentage of shares held by government.	Annual report
Foreign ownership	FSH	Percentage of shares held by foreigners.	Annual report
Control variables: Firm level			
Board size	BSIZE	The natural logarithm of the total number of directors on the board.	Annual report
CEO-Chair separation	SEPARATION	A dummy variable that equals 1 if the CEO and the chair are two different individuals, and 0 otherwise.	Annual report
Board gender diversity	BDIVG	The percentage of women directors to the total number of board directors.	Annual report
Firm size	FSIZE	Natural logarithm of total assets of the bank.	Annual report
Capitalization	CAP	Equity capital divided by total assets.	Annual report
Liquidity	LIQ	Liquid assets divided by total assets.	Annual report
Deposit	DEP	The ratio of total deposit to total assets	Annual report
Age of the bank	AGE	Natural log of the total number of years since a company was established.	Annual report
Audit firm size	BIG4	A dummy variable that takes the value of 1 if a firm is audited by a big four audit firm (PricewaterhouseCoopers, Deloitte & Touche, Ernst & Young, and KPMG), 0 otherwise.	Annual report
Control variables: Country			
Inflation	INFL	Natural log of GDP (annual growth)	International Monetary Fund
Gross domestic product.	GDP	Natural log of GDP (annual growth)	World Bank
Country dummies	CDU	Dummies for the 16 countries.	
Year dummies	YDU	Dummies for the years 2007 to 2018 inclusive.	

Table 3: Descriptive Statistics of all variables for all the 2027 bank years

Variable	Mean	Median	Std. Dev.	Minimum	Maximum
Panel A: Dependent variable					
Z-score	0.610	0.26	0.980	0.03	2.42
NPLs	5.17	2.30	9.07	2.45	68.00
LPROV	1.52	0	3.26	1.82	37.00
Panel B: Board attributes					
EXPERT (%)	58.23	57.14	14.77	10.00	88.83
NBMs (%)	4.98	5.00	1.46	2.00	12.00
Panel C: Ownership variables					
ISH (%)	75.54	92.66	18.51	11.78	100.00
GSH (%)	5.46	35.10	20.08	0.00	100.00
FSH (%)	17.62	21.69	7.77	0.00	42.07
Panel D. Bank control variables					
BSIZE	9.00	9.00	3.19	4.00	24.00
SEPARATION	1.00	1.00	0.02	0.00	1.00
BDIVG (%)	24.79	25.00	13.45	0.00	83.33
FSIZ ($m)	9.52	9.11	2.92	2.35	17.26
CAP	0.20	0.13	0.32	0.02	0.99
LIQ	0.96	0.97	0.09	0.05	0.99
DEP	77.28	76.51	15.85	5.83	95.87
AGE	36.00	26.00	29.96	2.00	178
BIG4	0.65	1.00	3.56	0.00	1.00
Panel E: Country control variables					
GDP	5.76	6.24	2.14	-16.42	20.13
INFL (%)	8.74	9.66	15.67	3.04	72.73

This tables provides the summary statistics of all the variables used in the regression analysis. Full definitions of variables used are provided in Table 2.

Table 4: Pearson's correlation matrices of the variables for the (2027) bank years

Variable	Z-score	NPLs	LPROV	BSIZE	EXPERT	BDIVG	NBMs	ISH	GSH	FSH	SEPARATION	CAP	FSIZE	LIQ	AGE	DEP	BIG4	GDP	INFL
Z-SORE	1																		
NPLs	0.035*	1																	
LPROV	0.184	0.327*	1																
BSIZE	0.046**	0.063*	0.116*	1															
EXPERT	-0.081**	-0.025*	-0.09**	0.058*	1														
BDIVG	-0.006**	-0.095*	0.069*	0.051*	0.159*	1													
NBMs	-0.035**	-0.056*	-0.026*	0.065*	0.063**	0.053*	1												
ISH	-0.009*	-0.008*	-0.025*	-0.036	-0.038*	-0.024	-0.016	1											
GSH	0.048**	0.027	0.038*	-0.007	-0.024	-0.031*	-0.005	-0.009	1										
FSH	0.012**	0.064*	0.067**	-0.030	-0.036	-0.028*	-0.009	0.096*	-0.023	1									
SEPARATION	-0.007*	-0.034*	-0.04	-0.08	0.056	-0.032	0.011*	-0.050	0.028	-0.041	1								
CAP	-0.013*	-0.052*	-0.186*	-0.041	0.029*	-0.046*	0.005*	-0.005	-0.004	0.136*	0.068	1							
FSIZE	-0.01***	-0.033*	-0.193*	-0.025	0.062*	0.035**	-0.026	0.027	-0.024	0.035*	-0.053	-0.028	1						
LIQ	0.078**	0.039*	0.004**	-0.002	-0.007	0.016*	0.001*	-0.001	-0.021	-0.004	-0.056*	-0.081	0.025	1					
AGE	0.023**	0.027**	0.037*	-0.016	0.038*	0.035*	-0.003	0.039*	0.054*	0.037*	0.089*	-0.087	0.024*	0.016	1				
DEP	0.003**	0.058**	0.036**	0.018	0.002*	0.041	-0.047	0.018*	0.057*	0.012*	0.015	-0.033	0.156*	0.037*	0.045	1			
BIG4	-0.005**	-0.018*	-0.021*	0.057*	-0.120*	0.056	0.001*	-0.058	0.066*	-0.035	0.060	0.017*	0.006*	-0.091	0.016	0.012	1		
GDP	-0.006**	0.056*	-0.037*	0.007*	0.008**	0.009*	-0.009	-0.074	0.176*	0.016*	0.033*	-0.054	0.143*	0.005	0.241	0.216	0.001	1	
INFL	0.019**	0.008**	0.005**	0.027*	-0.054*	0.012*	0.018*	0.014*	0.006*	-0.125	-0.042	0.017*	0.010*	-0.003	0.015	0.006	0.016	0.016*	1

Notes: The figures indicate the Pearson's correlation coefficients. ***, ** and * indicate that the correlation is respectively significant at 1%, 5% and 10% levels. Full definitions of variables used are provided in Table 2.

Table 5: The effect of various corporate governance variables on bank risk-taking

Dependent variables Model Independent variables	Z-Score (1)	NPLs (2)	LPROV (3)
EXPERT	-0.008***	-0.002**	-0.006**
	(-3.54)	(-2.29)	(-2.41)
NBMs	-0.330***	-0.042*	-0.750***
	(-2.83)	(-1.78)	(-2.80)
ISH	-0.007***	-0.004***	-0.005
	(-2.70)	(-3.06)	(-1.54)
GSH	0.005*	0.009***	0.017
	(1.69)	(2.89)	(1.40)
FSH	0.006***	0.004***	0.003
	(3.37)	(2.74)	(1.37)
SEPARATION	-0.089	-0.071	-0.085
	(-0.45)	(-0.64)	(-0.05)
BSIZE	0.230**	0.116*	0.309
	(1.95)	(1.72)	(1.48)
BDIVG	-0.002	-0.0004	-0.018
	(-1.32)	(-1.08)	(-1.56)
FSIZE	-0.063***	-0.006**	-0.173
	(-4.68)	(-2.11)	(-0.96)
CAP	-0.002	-0.350**	-0.178
	(-0.89)	(-1.92)	(-1.44)
LIQ	0.056***	0.139***	0.358**
	(3.86)	(4.20)	(2.56)
AGE	0.115**	0.008**	0.082*
	(2.30)	(2.02)	(1.77)
BIG4	-0.317***	-0.143*	-1.380
	(-2.84)	(-1.81)	(-1.39)
DEP	0.004**	0.001	0.005
	(2.45)	(1.62)	(1.35)
Country control variables			
GDP	-0.206***	0.148***	-0.217
	(-2.67)	(3.05)	(-1.52)
INFL	0.573***	0.018	2.516***
	(2.84)	(1.57)	(3.64)
Constant	-3.919***	0.689**	1.180***
	(-4.55)	(1.93)	(3.75)
CDU	Yes	Yes	Yes
YDU	Yes	Yes	Yes
Adjusted R^2	0.446	0.423	0.414
No. of obs.	2027	2027	2027

Notes: This table presents the OLS regression results on the impact of corporate governance structures on bank risk-taking proxies. T-statistics estimated using robust standard errors are reported in parentheses. ***, ** and * indicate statistical significance at 1%, 5% and 10% levels, respectively. The definitions of the variables used in the analysis are provided in Table 2. Variables are defined as follows: Individual financial directors who are financial experts (EXPERT), number of board meetings (NBMs), CEO-chair separation (SEPARATION), institutional ownership (ISH), government ownership (GSH), Foreign ownership (FSH), board size (BSIZE), board gender diversity (BGDIVG), firm size (FSIZE), capitalization (CAP), liquidity (LIQ) and age (AGE), BIG4 (audit firm size), deposit (DEP), gross domestic product (GDP) and inflation (INFL).

Table 6. Additional analysis: the effect of various corporate governance variables on bank risk-taking in different periods

Additional analysis	Post- CG reforms (2013-2018)			Pre- CG reforms (2007-2012)		
Dependent variables	Z-Score	NPLs	LPROV	Z-Score	NPLs	LPROV
Model	(1)	(2)	(3)	(4)	(5)	(6)
Independent variables						
EXPERT	-0.185***	-0.015**	-0.012**	-0.005	-0.004	-0.001
	(-3.27)	(-2.18)	(-2.56)	(-1.62)	(-1.38)	(-1.07)
NBMs	-0.730***	-0.134*	-0.980***	-0.067	-0.007	-0.354
	(-2.94)	(-1.82)	(-3.14)	(-1.48)	(-1.29)	(-1.62)
ISH	-0.017***	-0.052***	-0.019*	-0.001*	-0.0004*	-0.001
	(-3.01)	(-2.80)	(-1.87)	(-1.72)	(-1.87)	(-1.33)
GSH	0.001**	0.002***	0.010	0.005	0.011	0.008
	(1.98)	(2.97)	(1.56)	(1.30)	(1.56)	(1.37)
FSH	0.003***	0.0001**	0.001	0.008	0.006	0.0001
	(2.82)	(2.46)	(1.55)	(0.95)	(1.55)	(1.04)
SEPARATION	-0.073	-0.088	-0.092	-0.056	-0.084	-0.077
	(-0.56)	(-0.79)	(-0.67)	(-0.48)	(-0.60)	(-0.92)
BSIZE	0.250**	0.110*	0.241	0.186	0.092	0.157
	(2.01)	(1.82)	(1.53)	(1.19)	(0.84)	(0.62)
BDIVG	-0.002	-0.001	-0.038	-0.006	-0.0001	-0.014
	(-1.55)	(-1.26)	(-1.62)	(-1.24)	(-1.47)	(-1.08)
FSIZE	-0.097***	-0.002**	-0.194*	-0.041**	-0.008**	-0.120*
	(-3.90)	(-1.97)	(-1.76)	(-1.97)	(-2.10)	(-1.81)
CAP	-0.005	-0.321**	-0.173	-0.003	-0.207*	-0.154
	(-1.32)	(-2.04)	(-1.58)	(-0.42)	(-1.85)	(-1.31)
LIQ	0.041***	0.148***	0.411**	0.040*	0.157**	0.209*
	(3.11)	(3.05)	(2.24)	(1.74)	(1.98)	(1.67)
AGE	0.124**	0.002**	0.062*	0.093*	0.002*	0.055*
	(2.58)	(2.39)	(1.83)	(1.82)	(1.77)	(1.89)
BIG4	-0.457***	-0.162*	-1.487	-0.187**	-0.110	-1.052**
	(-3.35)	(-1.77)	(-1.50)	(-2.05)	(-1.57)	(-2.46)
DEP	0.005**	0.0003*	0.001	0.004*	0.0001	0.005
	(1.99)	(1.69)	(1.48)	(1.86)	(1.49)	(1.08)
Country control variables						
GDP	-0.355***	0.120***	-0.210	-0.187*	0.084**	-0.154
	(-3.61)	(3.54)	(-1.61)	(-1.71)	(2.56)	(-1.29)
INFL	0.684***	0.002	2.307***	0.452*	0.004	1.895*
	(2.72)	(1.55)	(2.82)	(1.68)	(1.29)	(1.81)
Constant	-4.895***	0.895**	1.357***	-2.056**	0.954*	0.984**
	(-5.23)	(2.18)	(2.80)	(-2.04)	(2.11)	(2.46)
CDU	Yes	Yes	Yes	Yes	Yes	Yes
YDU	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.420	0.411	0.438	0.302	0.409	0.421
No. of obs.	1132	1132	1132	895	895	895

Notes: This table presents the OLS regression results on the impact of corporate governance structures on bank risk-taking proxies for two different periods: post-CG reforms (2013–2018) and pre-CG reforms (2007–2012). T-statistics estimated using robust standard errors are reported in parentheses. ***, ** and * indicate statistical significance at 1%, 5% and 10% levels, respectively. The definitions of the variables used in the analysis are provided in Table 2. Variables are defined as follows: Individual financial directors who are financial experts (EXPERT), number of board meetings (NBMs), CEO-chair separation (SEPARATION), institutional ownership (ISH), government ownership (GSH), Foreign ownership (FSH), board size (BSIZE), board gender diversity (BGDIVG), firm size (FSIZE), capitalization (CAP), liquidity (LIQ) and age (AGE), BIG4 (audit firm size), deposit (DEP), gross domestic product (GDP) and inflation (INFL).

Table 7. Additional analysis: the effect of short-term and long-term institutional ownership on bank risk-taking

Dependent variables	Z-Score	NPLs	LPROV
Model	(1)	(2)	(3)
Independent variables			
PENSION FUNDS_ ISH	-0.275***	-0.097**	-0.038*
	(-3.26)	(-2.55)	(-1.72)
INSURANCE FRIMS_ ISH	-0.098***	-0.066*	-0.020*
	(-2.74)	(-1.92)	(-1.85)
MUTUAL FUNDS_ISH	0.003*	0.001	0.002
	(1.86)	(1.63)	(0.96)
SEPARATION	-0.048	-0.070	-0.065
	(-0.67)	(-0.54)	(-0.83)
BSIZE	0.294**	0.138*	0.290
	(2.30)	(1.69)	(1.56)
BDIVG	-0.007	-0.0005	-0.008
	(-0.80)	(-1.43)	(-1.37)
FSIZE	-0.083***	-0.016**	-0.189
	(-3.24)	(-2.30)	(-1.43)
CAP	-0.026	-0.407**	-0.172
	(-1.49)	(-2.52)	(-1.64)
LIQ	0.083***	0.201***	0.302**
	(2.87)	(3.59)	(2.10)
AGE	0.009**	0.004**	0.063*
	(2.15)	(2.37)	(1.82)
BIG4	-0.396***	-0.263*	-1.297
	(-3.30)	(-1.69)	(-1.44)
DEP	0.008**	0.002	0.006
	(2.53)	(1.54)	(1.49)
Country control variables			
GDP	-0.275***	0.163***	-0.204
	(-2.42)	(2.70)	(-1.48)
INFL	0.654***	0.012	1.980***
	(2.31)	(1.46)	(2.87)
Constant	-4.597***	0.764**	2.360***
	(-3.28)	(2.37)	(3.28)
CDU	Yes	Yes	Yes
YDU	Yes	Yes	Yes
Adjusted R^2	0.386	0.403	0.345
No. of obs.	1895	1895	1895

Notes: This table presents the OLS regression results on the impact of corporate governance structures on bank risk-taking proxies. T-statistics estimated using robust standard errors are reported in parentheses. ***, ** and * indicate statistical significance at 1%, 5% and 10% levels, respectively. The definitions of the variables used in the analysis are provided in Table 2. Variables are defined as follows: public pension funds institutional ownership (PENSION FUNDS_ ISH), insurance firms' institutional ownership (INSURANCE FRIMS_ ISH), mutual funds institutional ownership (MUTUAL FUNDS_ISH), CEO-chair separation (SEPARATION), board size (BSIZE), board gender diversity (BGDIVG), firm size (FSIZE), capitalization (CAP), liquidity (LIQ) and age (AGE), BIG4 (audit firm size), deposit (DEP), gross domestic product (GDP) and inflation (INFL).

Table 8: The effect of various corporate governance variables on bank risk-taking using 2SLS

Dependent variable	Z-Score	NPLs	LPROV
Model	(1)	(2)	(3)
Independent variables			
EXPERT	-0.013***	-0.005**	-0.008**
	(-2.74)	(-2.28)	(-1.95)
NBMs	-0.253*	-0.050*	-0.738***
	(-1.82)	(-1.75)	(-2.67)
ISH	-0.008***	-0.002***	-0.004
	(-4.30)	(-3.71)	(-1.61)
GSH	0.006*	0.008***	0.013
	(1.95)	(2.89)	(1.47)
FSH	0.009***	0.006***	0.002
	(3.40)	(3.53)	(1.09)
SEPARATION	-0.077	-0.064	-0.073
	(-0.56)	(-0.78)	(-0.09)
BSIZE	0.246**	0.115*	0.356
	(2.20)	(1.81)	(1.44)
BDIVG	-0.003	-0.002	-0.016
	(-1.43)	(-1.57)	(-1.50)
FSIZE	-0.068***	-0.006**	-0.171
	(-3.55)	(-2.46)	(-1.13)
CAP	-0.011***	-0.364**	-0.153
	(-2.83)	(-1.98)	(-1.58)
LIQ	0.595**	0.137***	0.352**
	(2.32)	(3.06)	(2.54)
AGE	0.116**	0.006**	0.063*
	(2.10)	(1.97)	(1.79)
BIG4	-0.329***	-0.096*	-1.557
	(-2.67)	(-1.70)	(-1.23)
DEP	0.008**	0.001	0.005
	(2.03)	(0.69)	(0.32)
Country control variables			
GDP	-0.312***	0.153***	-0.315
	(-3.55)	(3.00)	(-0.57)
INFL	0.473***	0.008	1.984***
	(2.94)	(0.82)	(3.85)
Constant	-2.730***	0.489*	2.097***
	(-4.28)	(1.68)	(3.02)
CDU	Yes	Yes	Yes
YDU	Yes	Yes	Yes
No. of obs.	1820	1820	1820
Over identification (p-value)	0.380	0.417	0.397
Endogeneity	0.021	0.040	0.085

Notes: This table presents the 2SLS regression results on the impact of corporate governance structures on bank risk-taking proxies. T-statistics estimated using robust standard errors are reported in parentheses. ***, ** and * indicate statistical significance at 1%, 5% and 10% levels, respectively. The definitions of the variables used in the analysis are provided in Table 2. Variables are defined as follows: Individual financial directors who are financial experts (EXPERT), number of board meetings (NBMs), CEO-chair separation (SEPARATION), institutional ownership (ISH), government ownership (GSH), foreign ownership (FSH), board size (BSIZE), board gender diversity (BGDIVG), firm size (FSIZE), capitalization (CAP), deposit (DEP), liquidity (LIQ) and age (AGE), BIG4 (audit firm size), gross domestic product (GDP) and inflation (INFL).

Table 9: The effect of various corporate governance variables on bank risk-taking using lagged model

Dependent variables Model Independent variables	Z-Score (1)	NPLs (2)	LPROV (3)
EXPERT	-0.004***	-0.005**	-0.007**
	(-3.37)	(-2.43)	(-2.53)
NBMs	-0.415**	-0.040*	-0.622**
	(-2.35)	(-1.73)	(-2.02)
ISH	-0.007***	-0.006**	-0.003
	(-3.72)	(-2.50)	(-1.07)
GSH	0.003**	0.008**	0.020
	(2.04)	(1.97)	(1.32)
FSH	0.009**	0.007***	0.012
	(2.39)	(3.23)	(1.05)
BSIZE	0.351***	0.120*	0.315
	(3.27)	(1.78)	(1.26)
SEPARATION	-0.057	-0.080	-0.045
	(-0.72)	(-0.93)	(-0.81)
BDIVG	-0.004	-0.001	-0.016
	(-1.05)	(-1.56)	(-1.32)
FSIZE	-0.089**	-0.005**	-0.167
	(-2.31)	(-2.18)	(-1.42)
CAP	-0.007	-0.394*	-0.174
	(-1.09)	(-1.68)	(-1.33)
LIQ	0.050**	0.152***	0.383**
	(2.35)	(3.40)	(2.54)
AGE	0.148*	0.008**	0.063*
	(1.73)	(2.41)	(1.75)
BIG4	-0.392**	-0.263*	-1.412
	(-2.01)	(-1.87)	(-0.79)
DEP	0.005**	0.002	0.004
	(2.42)	(1.04)	(1.56)
Country control variables			
GDP	-0.417***	0.146***	-0.257
	(-3.28)	(3.85)	(-1.39)
INFL	0.386***	0.009	2.350**
	(2.83)	(1.47)	(2.43)
Constant	-3.432***	0.658*	1.174***
	(-4.10)	(1.94)	(3.20)
CDU	Yes	Yes	Yes
YDU	Yes	Yes	Yes
Adjusted R^2	0.421	0.410	0.427
No. of obs.	2026	2026	2026

Notes: This table presents the lagged model results on the impact of corporate governance structures on bank risk-taking proxies. T-statistics estimated using robust standard errors are reported in parentheses. ***, ** and * indicate statistical significance at 1%, 5% and 10% levels, respectively. The definitions of the variables used in the analysis are provided in Table 2. Variables are defined as follows: Individual financial directors who are financial experts (EXPERT), number of board meetings (NBMs), CEO-chair separation (SEPARATION), institutional ownership (ISH), government ownership (GSH), foreign ownership (FSH), board size (BSIZE), board gender diversity (BGDIVG), firm size (FSIZE), capitalization (CAP), deposit (DEP), liquidity (LIQ) and age (AGE), BIG4 (audit firm size), gross domestic product (GDP) and inflation (INFL).

Table A1: Sample of websites of the banks in the Sub-Saharan Africa region

No.	Country	Bank Name	Website	Accessed dates for data collection
1	Botswana	Bank of Gaborone	https://www.bankgaborone.co.bw/Pages/Annual_Reports.aspx	01/10/2016 -31/12/2019
2	Gambia	Ecobank Gambia	https://www.ecobank.com/gm/personal-banking/countries	01/10/2016 -31/12/2019
3	Ghana	Fidelity Bank Ghana	https://www.fidelitybank.com.gh/downloadables/financial-reports	01/10/2016 -31/12/2019
4	Kenya	National Bank Kenya	https://www.nationalbank.co.ke/investor-relations	01/10/2016 -31/12/2019
5	Lesotho	Lesotho Post Bank	https://www.lpb.co.ls/#lpb_modal	01/10/2016 -31/12/2019
6	Liberia	Liberian Bank for Development	https://lbdi.net/downlaods.php	01/10/2016 -31/12/2019
7	Malawi	National Bank of Malawi.	https://natbank.co.mw/publications/annual-reports	01/10/2016 -31/12/2019
8	Mauritius	Mauritius Commercial Bank.	https://www.mcb.mu/en/about-us#37729	01/10/2016 -31/12/2019
9	Namibia	Bank Windhoek Limited	https://www.bankwindhoek.com.na/Pages/Reports.aspx	01/10/2016 -31/12/2019
10	Nigeria	United Bank for Africa	https://www.ubagroup.com/investor-relations/investor	01/10/2016 -31/12/2019
11	Sierra Leone	National Development Bank	https://www.ndbbank.com/downloads	01/10/2016 -31/12/2019
12	South Africa	Absa Group Limited	https://www.absa.africa/absaafrica/investor-relations/annual-reports/	01/10/2016 -31/12/2019
13	Tanzania	Amana Bank	https://amanabank.co.tz/banking/financials	01/10/2016 -31/12/2019
14	Uganda	ABC Bank Uganda Limited	https://www.abccapitalbank.co.ug/annual-report/	01/10/2016 -31/12/2019
15	Zambia	Zanaco Bank	https://zanacoinvestor.com/#reports	01/10/2016 -31/12/2019
16	Zimbabwe	Zimbabwe Development Bank	https://www.idbz.co.zw/investor-relations/financials/annual-reports	01/10/2016 -31/12/2019