AUDIT COMMITTEE CHARACTERISTICS AND AUDIT QUALITY ON RISK-TAKING BEHAVIOUR OF BANKS IN AN EMERGING ECONOMY

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Abstract

The study examined the effect of audit committee size, audit committee independence and audit quality on bank risk-taking behaviour in Ghana. The study collected data on 18 out of 24 commercial banks in Ghana over a 10-year period. The study relied on panel-corrected standard errors (PCSE) to establish the relationship between the variables mentioned above. The results of the study showed that audit quality reduces bank risk-taking behaviour in Ghana. The study also found that audit committee independence reduces excessive risk-taking behaviour by banks in Ghana thereby increasing their Z-scores. The study also found that even though there was a positive coefficient between audit committee size and the Z-scores of commercial banks in Ghana, the relationship was statistically insignificant. On the control variables, the study found that bank liquidity reduces risk-taking behaviour whiles non-performing loans increases bank risk-taking behaviour. The implication of the finding is that the Bank of Ghana should emphasize the need for banks to have independent audit committees and high-quality audits to help reduce their excessive risk-taking behaviour to prevent another financial sector clean-up. The study is important as it demonstrates the importance of audit quality and audit committee independence in reducing excessive risk-taking by commercial banks in Ghana which is critical for the sustenance of the financial system of Ghana. The study also supports the theoretical view that quality audit helps to improve the monitoring of management and ensure that banks are run properly.

Keywords: Audit Committee Characteristics, Audit Quality, Bank Risk-Taking Behaviour, Ghana

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1. INTRODUCTION

Ghana's financial sector witnessed a major downturn when the Bank of Ghana revoked the license of 7 commercial banks and over 200 non-bank financial institutions in what the central bank called the financial sector clean-up exercise between 2017 and 2019 (Avortri & Agbanyo, 2020; Musah et al., 2022; Kusi et al., 2018). The majority of these financial institutions experienced continuous liquidity challenges which were attributed to excessive risk-taking behaviour (Affum, 2020; Torku & Laryea, 2021). Several jobs were lost as a result of the exercise and there was a general loss in confidence in the financial sector in Ghana (Avortri & Agbanyo, 2020; Affum, 2020). There have been a number of studies conducted to understand the main cause of the excessive risk-taking and poor corporate governance which were the two main arguments advanced by the Bank of Ghana for the clean-up exercise that cost the Ghanaian tax payers about 25 billion GHS (Ghanaian cedis). The Bank of Ghana also came up with new governance reforms to help improve the internal governance mechanisms of the banks and reduce their excessive risk-taking behaviour. Risk management is one of the most important aspects of bank management as it is linked to the sustainability and profitability of the bank (Fakhrunnas & Ramly, 2016; Srivastav & Hagendoff, 2016). Firms including banks can be financially distressed as a result of their risk-taking behaviour which affects their ability to implement the right strategy to make the bank more profitable (Musah et al., 2022; Stulz, 2014; Arouri et al., 2014). The risk-taking behaviour of banks is a major concern because the collapse of a bank has a contagion effect across the financial sector and the economy as a whole (Nguyen, 2022). In Ghana, the risk-taking behaviour of commercial banks is an important subject given the collapse of several financial commercial banks and non-bank financial institutions which was largely attributed to excessive risk-taking behaviour (Musah et al., 2022; Kusi et al., 2018). Firms manage risk by reducing the present value of the future cost of distress by incurring cost that is lower than the amount in which the present value is reduced which increases firm value (Stulz, 2014). However, banks are different from other firms as they create assets through liabilities (Musah et al., 2021). The risk management of a bank is intrinsic to its business model which is different from non-financial firms (Boateng et al., 2022; Faccio et al., 2016; Srivastav & Hagendorff, 2016; Stulz, 2016; Sila et al., 2016). An increase in the risk of banks can enable them to invest in assets that are valuable but can also result in losses and as such, there is an optimal amount of risk, a bank can take from the perspective of the shareholders (Bokpin, 2016; Kusi et al., 2018). This means that a well-governed bank should have a system in place that will help them identify the optimal risk it must take to reduce its exposure and enhance performance (Musah et al., 2022). Excessive risk-taking behaviour does not only have a consequence on the survival of banks but depositors as they may lose their deposits in case of a collapse as happened in Ghana (Musah et al., 2022). From a theoretical point of view, the problem of a bank in this context is very simple as it just has to undertake project or investments that increase value and reduces total bank risk (Stulz, 2016). In practice, however, it can be difficult as risk-taking decisions of banks are an everyday thing and each decision has implications on the overall bank risk which affects the degree of financial distress (Boateng et al., 2022; Stulz, 2014).

Board of directors and other corporate governance structures have their main responsibility in protecting the interest of shareholders by providing oversight over the bank's risk management and encouraging the managers to take the excessive risk that will benefit shareholders (Bokpin, 2016; Musah et al., 2022). This means that high-quality governance may increase bank risk-taking behaviour. The audit function in a bank is a very important part of its governance structure. Both internal and external audit functions as well as the audit committee of the board of directors provide the key information through the board supervision and monitoring. Internal auditing plays an important role in every organization but more importantly in commercial banks as it seeks to implement control mechanisms that help to reduce risk in the organization (Nguyen, 2022; Rijamampianina, 2016). The internal audit unit also helps the bank to function effectively and efficiently which is why banks are required to review the soundness of their corporate governance, risk management and internal control systems (Sarens & Abdolmohammadi, 2011; Nguyen, 2022; Soh & Martinov-Bennie, 2011). The audit committee helps strengthens the internal audit unit which helps them to implement a strong internal control mechanism to safeguard the bank's assets and reduce excessive risk-taking behaviour by banks.

Even though risk-taking is an intrinsic part of a bank business model, limited studies have examined how certain governance structures influence bank risk-taking behaviour (Musah et al., 2021; Musah et al., 2022; Nguyen, 2022; Kusi et al., 2018; Bokpin, 2016). The few studies have focused on board characteristics and how it affects bank risk-taking behaviour (Musah et al., 2021; Musah et al., 2022; Kusi et al., 2018; Bokpin, 2016; Faccio et al., 2016; Srivastav & Hagendorff, 2016; Stulz, 2016; Sila et al., 2016; Fakhrunnas & Ramly, 2017; Felício et al., 2018). Moreover, most of these studies have focused on developed and emerging economies with little from Africa or even the Ghanaian context. Even though some empirical studies have examined the link between the audit committee and the risk-taking behaviour of banks in other jurisdictions (Sun & Liu, 2014), the unique case of the financial sector crisis in Ghana between the 2017/2018 financial year presents a different context to examine these variables. There is currently a lack of empirical evidence linking audit quality and bank risk-taking behaviour in Ghana. The recent financial sector crisis in Ghana was largely a result of excessive risk-taking behaviour by some commercial banks which resulted in their collapse (Musah et al., 2022; Kusi et al., 2018; Torku & Laryea, 2021). Some audit firms were also fined by the Institute of Chartered Accountants Ghana (ICAG) for their role in the collapse of the banks (Musah et al., 2021). They were found guilty of not conducting an effective external audit that will ensure that banks do not hide their liabilities through creative accounting. The above shows that quality audits could be critical in reducing excessive risk-taking behaviour by banks. Despite, the above admission, there is no empirical evidence that links audit committees which are a critical component of corporate governance structures and systems and audit quality

to the risk-taking behaviour of banks. Given the gaps in the literature identified above and the absence of previous studies linking audit committee characteristics and audit quality to bank risk-taking behaviour in developing countries, this study addresses these gaps by examining the influence of audit committee characteristics and audit quality of commercial banks in Ghana on their risk-taking behaviour.

The study makes significant contributions to literature and policymaking in Ghana. Since previous studies in Ghana have not examined the influence of audit committee characteristics on bank risk-taking behaviour even after the financial sector crisis in Ghana, the study will add to the existing literature. The study also extends previous studies on the relationship between corporate governance and bank risking behaviour to include audit characteristics and bank risk-taking behaviour. The study results showed that audit quality reduces excessive risk-taking behaviour among commercial banks which has significant policy implications for policymakers in Ghana. The findings of the study are useful to the bank of Ghana and other regulatory bodies in formulating appropriate corporate governance mechanisms and structures for the banking sector in Ghana. The results will also help shareholders of banks and management understand the importance of quality audits on risk management of commercial banks.

The rest of this study has been divided into the following sections. Section 2 contains the literature review and formulation of the hypotheses. Section 3 deals with the details of the methodology of research. Section 4 highlights the research results and discussion, and finally, Section 5 concludes with and formulation of recommendations.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1. Audit committee size and risk-taking behaviour

According to previous research, the formation of an audit committee in a corporation is a sign of greater board effectiveness and efficiency (Nguyen, 2022; Adams & Jiang, 2016). According to agency theory, a robust audit committee with regular meetings and trained and knowledgeable members can exert control over the behaviour of directors (Jermias & Gani, 2014). This can add value to agents by assessing and appraising businesses' management plans and strategies regularly (Adams & Jiang, 2016; Jensen & Meckling, 1976). The size of an audit committee is believed to be associated with its effectiveness and hence can influence affecting risk-taking behaviour of banks (Nguyen, 2022). Nguyen (2022) argued that the size of the audit committee is a significant determinant of their effectiveness which can affect the risk-taking behaviour of banks. Furthermore, agency theory implies that a better and stronger audit committee can help organizations stand out from the crowd by encouraging them to take greater risks (Dang & Nguyen, 2021; Sun & Liu, 2014; Connelly et al., 2011). In essence, the agency theory advocates for higher risk-taking as a means of maximizing shareholder wealth. Also, the moral hazard theory argues that shareholders encourage bank managers to invest in high-risk projects which will benefit shareholders but can be at the expense of depositors (Nguyen, 2022). Previous research on the audit committee and risk-taking behaviour have

yielded mixed outcomes. Jermias and Gani (2014), for example, establish a strong negative link between the audit committee and risk-taking. Adams and Jiang (2016), on the other hand, discover no link between the audit committee and risk-taking. The audit committee and risk-taking have a considerable negative association, according to Hsu and Petchsakulwong (2010). Nguyen (2022) found that audit committee meetings negatively affect bank risk-taking. Accordingly, the final hypothesis is:

H1: There is a positive relationship between audit committee size and lower risk-taking behaviour of banks.

2.2. Audit committee independence and risk-taking behaviour

If the audit committee is independent, they will be able to perform their duties successfully. One of the most significant aspects of the audit committee is its independence. Previous research has not looked into the link between audit committee independence and bank risk-taking behaviour. However, some researchers have looked into the risk-taking behaviour of independent directors and banks. Because members of the audit committee are also board members, the findings may be applicable. Organizations with a lack of independent directors, on the other hand, are more likely to raise investor concerns, resulting in higher agency fees and, as a result, lower performance (Connelly et al., 2011; Core, 2000; Tanda, 2015). As a result, agency theory emphasizes the significance of independent directors in balancing the effects of competing interests (Adams & Jiang, 2016; Li & Wearing, 2012; Nguyen, 2022; de Jorge Moreno et al., 2019). Independent directors, in particular, use corporate governance principles to protect the interests of shareholders (Musah et al., 2021). However, other academics believe that boards with a majority of independent directors might hurt a company's success (Musah et al., 2019; Kusi et al., 2018). Independent directors, according to Weir and Laing (2000), sometimes have less expertise in the company and have limited time to oversee managers, as well as difficulty understanding the firm's intricacies. Based on the above, the third hypothesis of this study is:

H2: There is a positive relationship between audit committee independence and lower bank risk-taking behaviour.

2.3. Audit quality and bank risk-taking behaviour

External audit plays a major role in the corporate governance process of companies including banks (Musah et al., 2022). External auditors act as agents who monitor the activities of management and ensure that the interest of shareholders and management are aligned. The quality of the audit influences the audit fees charged (Coffie & Bedi, 2019). The quality of the audit is important to several stakeholders and it guarantees the credibility of the financial statement (Coffie et al., 2018). There is a standard measurement for audit quality and hence previous studies have relied on proxies such as big four audit firms or the use of audit fees as a proxy for audit quality (Rajgopal et al., 2021; Coffie et al., 2018). This study adopted audit fees as a proxy for audit quality because it is believed to be more robust than the use of the big four audit firms

as a proxy. Previous studies have not directly linked audit fees which is also a measure of audit complexities with bank risk-taking behaviour. Some of them have looked at this issue relating to the relationship between audit quality and the risk-taking behaviour of entities using big four audit firms as a proxy for audit quality. The results of these studies show a negative or no significant relationship between the two variables (Sri & Solimun, 2019; Titman & Trueman, 1986) and others show a positive relation (de Jorge Moreno et al., 2019; Knechel & Willekens, 2006). None of the studies that we are aware of examines the relationship in the Ghanaian banking industry. This study measure audit quality using audit fees. Higher audit fees can reduce the independence of auditors thereby reducing their ability to check management. On the other hand, higher audit fees can be used as a measure of high-quality audit as it suggests greater audit effort in the evidence-gathering process before the determination of the audit opinion (Rajgopal et al., 2021). This will likely allow management to take higher risks. On the other hand, higher audit fees suggest good audit quality which will reduce excessive risk-taking by the banks. Based on this argument, the study hypothesizes that:

H3: There is a positive relationship between audit quality and bank risk-taking behaviour in Ghana.

3. RESEARCH METHODOLOGY

The study adopted the quantitative research design which is consistent with the objectives of the study. The main source of data for the study is secondary data extracted from the financial statement of the commercial banks sampled for the study. The study sampled 18 banks out of the 24 registered banks in Ghana due to the availability of data. The study period covered 10 years from 2011 to 2020. In the case of this study, the availability of data for the variables under consideration for the sample population of banks within the sample range of years is the major challenge. The different emerging years for the various banks within the time range make it obvious that banks that emerged and started operations in the latter years did not have the required data for the study. This benchmark is one of the many employed in sample selection for this study. The study only sampled commercial banks whose financial statements were filed with the regulator and were publicly available for the study.

Ghana has a peculiar case, in that most of the banks in Ghana are not listed on the stock exchange. This makes it impossible to compute the standard deviation of equity returns or equity price volatility for most of the banks since only a few of them are listed on the stock exchange. In effect, risk measures that involve the standard deviation of equity returns or equity price volatility cannot be employed. Also, the researchers are interested in total risks; therefore, using credit risk will not be appropriate. The Z-score is employed since its computation involves the standard deviation of asset returns which the researcher can obtain for all the sample banks Moreover, the Z-score is used to indicate total risk. This justifies the use of the Z-score as a proxy for risk for the study. The Z-score has always been used as a proxy, and it is utilized to analyze the factors that affect the risk-taking behaviour of banks in previous studies (Boateng et al., 2022; Nguyen, 2022; Musah et al., 2022). The dependent variable is bank risk-taking, which is a proxy for bankruptcy risk (Z-Score). The Z-score indicates the likelihood of a bank going bankrupt; the greater the Z-score, the lower the bank's danger of going bankrupt. The credit risk assessment then evaluates the bank's capacity to manage its financing process. In other words, a higher Z-score denotes reduced risk, while a lower Z-score denotes higher risk.

The Z-score is measured as follows.

$$Z\_Score = \frac{ROA + CAR}{\sigma ROA} \tag{1}$$

where,
- ROA is calculated as:

$$ROA = Net\ Income/Total\ Assets$$

- CAR (Capital adequacy ratio) is calculated as:

$$CAR = Total\ Equity/Total\ Assets$$

- σROA represents the standard deviation of ROA

Audit committee independence, audit committee size and audit quality measured by audit fees constitute the main independent variables. Bank size and profitability constitute the other control variables to be included in the model.

The estimated panel regression model for the study is presented below.

$$Risk_{it} = \beta_0 + \beta_1 AudSize_{it} + \beta_2 AudInd_{it} + \beta_3 AudQuality_{it} + \beta_4 BankSize_{it} + \beta_5 BankLiqd_{it} + \beta_6 NPL_{it} + \beta_7 Deposits_{it} + \beta_8 Branches_{it} + \varepsilon_{it} \tag{2}$$

Table 1. Measurement of variables

Variable	Definition	Measurement
Risk	Bank risk-taking behaviour	Z-scores of banks
AudSize	Audit committee size of banks	Number of members on the audit committee
AudInd	Audit committee independence	Proportion of non-executive directors on the audit committee
AudQuality	Audit quality	Natural logarithm audit fees
BankSize	The size of the bank	Natural logarithm of total assets
BankLiquid	Bank liquidity	Liquid assets divided by liquid liabilities
NPL	Non-performing loans	The ratio of non-performing loans to total loans and advances
Deposits	Customers deposits	Natural logarithm of customers deposits
Branches	Number of branches	Number of banks branches for a year

4. RESEARCH RESULTS AND DISCUSSION

4.1. Descriptive analysis

The section presents a brief analysis of the variables that were used for the analysis. The section focused on presenting a description of the variable and what they represent before conducting the other statistical analysis.

The summary of the descriptive statistics is presented in Table 2 below.

Table 2. Descriptive statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
Risk	180	0.206	0.123	0.0113	0.757
AudSize	180	3.647	0.921	3.000	5.000
AudInd	180	0.936	0.127	0.400	1.000
AudQuality	180	5.358	0.507	3.916	7.720
BankSize	180	9.138	0.450	7.615	10.030
BankLiquid	180	0.696	0.474	0.300	5.960
NPL	180	0.049	0.041	-0.045	0.201
Deposits	180	9.062	0.394	7.954	9.906
Branches	180	47.650	36.741	2.000	184.000

The first variable in Table 2 is the Z-scores (*Risk*) of the banks sampled for the study which is used as a proxy for bank risk-taking behaviour in Ghana. The Z-scores are an indication of the risk appetite of the bank but most importantly the risk of financial distress or bankruptcy of the bank. The higher the Z-score of a bank, the less risky the bank is in terms of being financially distressed or at risk of bankruptcy. The results from Table 2 show a mean Z-score of almost 21% with a minimum of 11% and a maximum of 76%. The result of the descriptive analysis of the Z-scores in Table 2 shows that generally, the banks sampled for the study have less risk of financial distress or bankruptcy. The results of the study show lower Z-scores compared to Fakhrunnas and Ramly's (2016) study on South Eastern Asian banks where the mean Z-scores for the banks sampled in that study was 46.44% and a minimum of 5.31 and a maximum of 349. This result suggests that commercial banks in Ghana are at a higher risk of bankruptcy compared to their counterparts in South Eastern Asia. The result is also inconsistent with the findings of Kuranchie-Pong (2013) whose study showed the mean Z-score of commercial banks in Ghana to be 43.85 based on a sample of 20 commercial banks from 2007 to 2011. The result suggests bank risk of financial distress is deteriorating based on the fact that the Z–score has been reduced in this study. The second variable (*AudSize*) in Table 2 examined the size of the banks' audit committees in Ghana. The result of the study suggests that the average audit committee of commercial banks is 4 with a minimum audit committee size of 3 directors and a maximum audit committee size of 5. The next variable (*AudInd*) looked at the independence of the audit committee which was measured as the proportion of non-executive directors on the audit committees of the banks sampled for the study. The results suggest that on average 94% of audit committee members of commercial banks in Ghana are non-executive directors and the bank with the minimum proportion of non-executive directors on the board is 40% whiles the bank with the maximum proportion of non-executive directors on the board is 100%. The result suggests that commercial banks in Ghana largely follow good corporate governance principles by insisting on a higher proportion of non-executive directors on their audit committees to guarantee their independence. The next variable (*AudQuality*) measured audit quality which is represented by audit fees. Studies have shown that the complexities of an audit result in higher audit fees and as such audit fees were used as a proxy for audit quality (Musah et al., 2018). The result showed that the natural logarithm of audit fees for commercial banks ranges from 3.91 to 7.72 with a mean of 5.36. On the control variables, the study included bank size (*BankSize*) which was measured as the natal logarithm of total assets. This variable ranges from 7.62 to 10.03 with a mean score of 9.138. This result is almost similar to the findings of Charmler et al. (2018) on the impact of bank liquidity on their profitability based on a sample of over 20 commercial banks in Ghana where the authors included bank size as a control variable and reported a mean score of 8.85 with a maximum of 9.53 and a minimum of 7.6. The next control variable (*BankLiquid*) focused on bank liquidity which was also measured as the ratio of total liquid assets to total interest-bearing liabilities. The results from the study showed a liquidity ratio ranging from 0.3 to 5.96 with a mean score of 0.69. The result shows that on average the banks sampled for this study have reasonable levels of liquidity and are consistent with the findings of Charmler et al. (2018). This ratio determines the banks' ability to use their liquid funds to meet obligations in the area of interest-bearing liabilities. The next control variable looked at the non-performing loans ratio (*NPL*) which was measured as an impairment charge to gross loans and advances. The result of the study showed that 4.9% of gross loans and advances were impaired over the study period which shows a high level of non-performing loans in the Ghanaian banking sector. The bank with the highest non-performing loan ratio had 20% of its loans and advances impaired over the study period. The study also included customer deposits (*Deposits*) as part of the control variables which could influence bank risk-taking behaviour and measured it using the natural logarithm of total deposits. The result showed that total loans and advances range from 7.95 to 9.91 with a mean score of 9.1. Finally, the last control variable (*Branches*) focused on the number of branches for each of the banks sampled over the study period. The result showed that the number of branches ranges from 2 branches to 184 branches with a mean number of branches of 48 over the study period. In essence, the bank with the minimum number of branches over the study period had only 2 branches whiles the one with the highest number of branches had 184 branches nationwide.

4.2. Correlation analysis

The study also used correlation analysis to examine the relationship between the independent variables as well as the control variables and bank risk-taking behaviour which is the dependent variable. The correlation analysis was also used to determine the presence of multicollinearity using the correlation coefficient of the independent variables among themselves. The results of the correlation analysis are presented in Table 3.

Table 3. Correlational analysis

Correlation	Risk	AudSize	AudInd	AudQuality	BankSize	BankLiquid	NPL	Deposits	Branches
Risk	1.000								
AudSize	0.6458**	1.000							
AudInd	0.6181***	0.2725	1.000						
AudQuality	0.7780***	0.1256	0.2838	1.000					
BankSize	0.6794**	0.1098	0.2330	0.4531	1.000				
BankLiquid	0.5149**	0.0528	0.1479	0.0959	0.0120	1.000			
NPL	-0.6417***	0.0041	-0.0405	0.2146	0.1687	-0.0282	1.000		
Deposits	0.5511**	0.2466	0.058	0.4280	0.5335	0.0780	0.1456	1.000	
Branches	0.4234**	0.1087	0.2290	0.4186	0.5522	0.0535	0.0455	0.4675	1.000

*Note: *** significant at 1% significance level; ** significant at 5% significance level; * significant at 10% significance level.*

The correlation analysis showed a positive correlation between audit committee size (*AudSize*) and bank risk-taking behaviour (*Risk*). The result simply suggests that banks with larger audit committee size take less risk which reduces their chance of financial distress and result in a higher Z-score. The result suggests that a higher audit committee size is associated with a higher Z-score which means reduced risk-taking by commercial banks in Ghana.

The second independent variable focused on the relationship between audit committee independence and bank risk-taking behaviour. The correlation analysis also a positive correlation between audit committee independence (*AudInd*) and bank risk-taking behaviour (*Risk*). The result also suggests that banks with a high proportion of independent directors on their audit committees increase bank risk-taking behaviour which results in a decrease in the Z-score of the bank.

The next independent variable examined the relationship between audit independence and bank risk-taking behaviour. Audit independence were measured using audit fees which could also represent audit quality. The result of the correlation analysis showed a positive correlation between audit independence and bank risk-taking behaviour. The result suggests that banks that have complex audit transaction which results in higher audit fees increase banks' Z-scores and in effect reduces bank risk of financial distress or bankruptcy. The result can be interpreted to mean that audit quality reduces bank risk-taking behaviour.

The next variable examined the relationship between bank size (*BankSize*) and risk-taking behaviour (*Risk*). The correlation result shows a positive relationship between bank size and Z-scores which represent bank risk-taking behaviour. The result suggests larger banks have high Z-scores which means a lower risk of financial distress or bankruptcy. Furthermore, the result is also contrary to the findings of Abou-El-Sood (2019) study on Egyptian banks which reported a negative and significant correlation between bank size and bank risk-taking behaviour even though the study measured risk-taking behaviour using the ratio of risk-weighted assets to total assets.

The next variable examined the effect of bank liquidity (*BankLiquid*) on bank risk-taking behaviour. The correlation analysis showed that there is a positive correlation between bank liquidity and risk-taking behaviour. However, the correlation is statistically insignificant. The result shows that banks with high liquidity are at a lower risk of financial distress or bankruptcy.

The next variable examined the effect of the non-performing loans ratio (*NPL*) on bank risk-

taking behaviour, in either word, the study examined the effect of non-performing loans on the level of financial distress or risk of bankruptcy of commercial banks in Ghana. The correlation analysis showed that there is a negative relationship or correlation between non-performing loans and Z-scores of the commercial banks over the study period. The result shows that banks with a high level of non-performing loans are at a higher risk of financial distress consistent with finance theory.

The next variable focused on the relationship between customers' deposits (*Deposits*) and bank risk-taking behaviour. The correlation analysis showed a positive correlation between customers' deposits and bank risk-taking behaviour. The result showed that an increase in customer deposits increases the Z-scores of commercial banks which shows a reduction in bank risk of financial distress.

The last variable examined the relationship between the number of branches (*Branches*) of commercial banks and risk-taking behaviour. The correlation analysis showed a positive correlation between the number of branches and the Z-scores of commercial banks in Ghana. The result is also statistically insignificant.

4.3. Regression analysis

The correlation analysis showed no evidence of multicollinearity as none of the independent variables had a correlation coefficient above 0.8. The study further used the variance inflation factor to determine the presence of multicollinearity and had the same conclusion as per the correlation matrix. The Hausman test showed that the random effect was not good as the result was significant at a 1% significance level suggesting that fixed effect was the best model for the study so the study used the generalized least square (GLS) regression model. To correct the disturbance in the data and also to address the problem of heteroscedasticity, the study used the model with panel-corrected standard errors. The regression analysis showed that the adjusted R-squared is 35% suggesting that the independent variables can only explain 35% of the variations in the dependent variable. The probability of the F-statistic or Wild Chi-square is statistically significant at a 1% significance level suggesting that the model is well fit. Generally, studies on bank risk behaviour report lower adjusted R-squared. For instance, Fakhrunnas and Ramly (2017) in their study reported an adjusted R-square of 9%. Loh and Sok-Gee (2017) in their study on the risk-taking behaviour of banks in Malaysia reported an adjusted R-squared of 9%, 13%, 30%, and 33% for the 4 models the study ran in their study. The result of the regression analysis is presented in Table 4.

Table 4. Panel corrected regression result

Variable	Coefficient	Std. Dev.	Z	P>Z
AudSize	0.0052	0.0078	0.68	0.495
AudInd	0.1439***	0.0848	5.21	0.000
AudQuality	0.0762***	0.0276	2.76	0.006
BankSize	0.0411	0.037	1.11	0.267
BankLiquid	0.0405***	0.0138	2.93	0.003
NPL	-0.526**	0.258	-2.04	0.042
Deposits	0.051	0.0391	1.31	0.191
Branches	0.0038*	0.0002	1.68	0.092
CONST	-0.077	0.2804	-0.28	0.783
R-Squared	0.352			
Wild Chi² (8)	25.01			
Prob>Chi²	0.001			

*Note: *** significant at 1% significance level; ** significant at 5% significance level; * significant at 10% significance level.*

The result of the analysis in Table 4 shows that there is a positive coefficient between size and the Z-scores of commercial banks but the relationship is statistically insignificant. The above result implies that the size of a bank audit committee is not a significant predictor of bank risk-taking behaviour in Ghana. The second independent variable examined the effect of audit committee independence on bank risk-taking behaviour. The result of the analysis in Table 4 showed a positive coefficient between bank audit committee independence and the Z-scores of the bank. The positive relationship between audit committee independence and bank risk-taking behaviour was also statistically significant which implies that banks with independent audit committees are able to reduce excessive risk-taking behavior thereby increasing their Z-scores. The next independent variable examined the relationship between audit quality and bank risk-taking behaviour in Ghana. The result of the analysis in Table 4 showed that audit quality which was measured using audit fees had a positive coefficient with bank risk-taking behaviour. The positive association between audit quality and bank Z-scores was also statistically significant at a 1% significance level which implies that the quality of the bank's audit reduces their risk-taking behaviour in Ghana.

On the control variables, the result of the regression analysis in Table 4 shows that there is a statistically insignificant coefficient between bank size and Z-scores which means the size of the bank is not a significant determinant of bank risk-taking behaviour. The regression result in Table 4 shows that there is a positive association between bank liquidity and risk-taking behaviour. The relationship is also statistically significant at a 1% significance level suggesting that the liquidity of banks is a significant determinant of bank risk-taking behaviour. The result shows that banks with high levels of liquidity have high levels of Z-scores and hence reduce the risk of financial distress among Ghanaian commercial banks. The regression analysis showed a negative association between non-perming loans and bank risk-taking behaviour. The result shows that banks with higher levels of non-performing loans increase their risk of financial distress which reduces the banks' Z-scores. The regression result shows that there is a positive relationship between customers' deposits and bank risk-taking behaviour. The result however is not statistically significant and suggest that customers' deposit is not a significant determinant of bank risk-taking behaviour. The regression analysis also showed that there is a positive relationship between bank branches and their risk-taking behaviour.

The result is also statistically significant at a 10% significance level suggesting that several bank branches are a significant determinant of bank risk-taking behaviour in Ghana. The result shows that banks with more branches reduce their risk of financial distress which increases their Z-scores.

4.4. Discussion of findings

The first independent variable of the study examined the effect of the audit committee size of banks on bank risk-taking behaviour in Ghana. The result of the study shows that audit committee size has a positive coefficient with bank risk-taking behaviour and the relationship is also statistically significant. The result is to a large extent contrary to the expectations of the first hypothesis of the study which predicted a positive and significant association between audit committee size and bank risk-taking behaviour. The result implies that banks do not reduce their excessive risk-taking behaviour through large audit committee size but perhaps the independence of the audit committee is what is more important in reducing excessive risk-taking. The result is consistent with the findings of Adams and Jiang (2016) who reported a statistically insignificant association between audit committee size and bank risk-taking behaviour. On the other hand, some studies reported a negative association between audit committee size and bank risk-taking behaviour contrary to the findings of this study. For instance, Jermias and Gani (2014) in their study reported a negative relationship between audit committee size and bank risk-taking behaviour and the relationship was statistically significant. Also, Hsu and Petchsakulwong (2010) in their study also found evidence of a negative and statistically significant association between bank audit committee size and bank risk-taking behaviour. In addition to the above, the result is also contrary to the findings of Sun and Liu (2014) who found a negative and statistically significant association between audit committee size and bank risk-taking behaviour. The result implies that the size of the audit committee alone cannot predict the risk-taking behavior of commercial banks in Ghana.

The second independent variable of the study examined the effect of audit committee independence on the bank risk-taking behaviour of commercial banks in Ghana. The regression analysis in Table 4 showed a positive association between audit committee independence and bank risk-taking behaviour. Again, the relationship is statistically significant at a 1% significance level and shows that audit committee independence is a significant determinant of bank risk-taking behaviour. The results show that banks with independent audit committees reduce their risk-taking behaviour in Ghana. The result is also consistent with the expectation of the second hypothesis of the study which predicted a positive association between audit committee independence and bank risk-taking behaviour. The result shows that banks with more non-executive directors on their audit committees reduce the risk appetite of management as it increases the risk of the Z-scores of commercial banks. The result suggests that external directors on the audit committee reduce management risk-taking behaviour of the management of commercial banks in Ghana consistent with the expectations that they will encourage management to be more cautious in

their risk-taking behaviour. Perhaps the independent directors on the audit committee are not driven solely by financial performance but by the stability of the bank and as such, they will encourage management to take more caution in risk in an attempt to maximize profit.

The third independent variable of the study examined the effect of audit quality which is proxied by audit fees and the bank risk-taking behaviour in Ghana. The regression analysis in Table 4 revealed a positive coefficient between audit quality and bank risk-taking behaviour. The association is also statistically significant at a 1% significance level suggesting that audit quality is a significant determinant of bank risk-taking behaviour. The result shows that banks with higher audit quality have a low-risk appetite and hence are associated with higher Z-scores in Ghana. The result is consistent with the expectations of the third hypothesis of the study which predicts a positive and significant relationship between audit quality and bank risk-taking behaviour in Ghana. The result can also be interpreted to mean that banks with high audit fees have higher audit quality which reduces their risk appetite and improve or reduces the probability of the bank becoming financially distressed. The result of the study is consistent with the outcome of several studies that also reported a positive and statistically significant association between audit quality or fees and bank risk-taking behaviour (de Jorge Moreno et al., 2019; Asthana et al., 2004; Knechel & Willekens, 2006; Bratton, 2007). On the other hand, the result of the study is contrary to the findings of some other studies in the literature that reported a negative association between audit quality and bank risk-taking (Titman & Trueman, 1986; Simunic & Stein, 1987; Beatty, 1989). Most of these studies used audit fees as a measure of audit quality. The result shows that higher audit quality or audit fees reduce bank risk-taking and hence reduce the banks' risk of financial distress.

5. CONCLUSION

The study examined the effect of the audit committee size of the board of directors on the bank's risk-taking behaviour. The study also examined the effect of audit committee independence on bank risk-taking behaviour and finally the study examined the effect of audit quality on bank risk-taking behaviour. The correlation analysis as well as the regression analysis show that there is a positive association between audit committee size and bank risk-taking behaviour. The result shows that banks with large audit committee sizes take calculated risks which

translate into increased Z-scores for such banks thereby reducing their risk of financial distress. The results for both correlation and regression analysis, however, were statistically insignificant which suggests that the audit committee size of commercial banks in Ghana is not a significant determinant of bank risk-taking behaviour. The result of the study showed a positive coefficient between audit committee independence and bank risk-taking behaviour among commercial banks in Ghana. The coefficient between the two variables was also statistically significant which implies that audit committee independence predicts bank risk-taking behaviour in Ghana. The study also revealed a positive relationship between audit quality and bank risk-taking behaviour. The association is also statistically significant at a 1% significance level suggesting that audit quality is a significant determinant of bank risk-taking behaviour. The implication of the above result is that banks with independent audit committees and high audit quality reduce their excessive risk-taking behaviour. The study also revealed that a large audit committee does not necessarily predict lower risk-taking behavior but only independent audit committees and high audit quality can reduce excessive risk-taking by banks in Ghana. The result of the study has significant policy implications for the Bank of Ghana in its quest to improve the risk management of commercial banks after the financial sector clean-up. The result suggests that the Bank of Ghana should include the requirement for independent audit committee members and high-quality audit for banks to reduce their excessive risk-taking behaviour.

Based on the conclusion above, the study makes the following recommendations. First, the study recommends that banks that want to reduce their risk of financial distress by increasing the Z-score should focus on high-quality audits and also increase the number of non-executive directors on the board as it reduces the bank's risk-taking behaviour. Secondly, banks that want to reduce their risk of financial distress should improve their liquidity as the study found that banks with higher liquidity have higher Z-scores. Third, banks must take steps to reduce their non-performing loans as it has the potential to increase their risk of financial distress. The study recommends that future studies examined the effect of audit characteristics on the risk-taking behaviour of non-banks listed on the Ghana stock exchange and include variables such as the financial and accounting expertise of audit committee members. Another study can examine the effect of corporate governance structures, gender diversity and ownership structure on bank risk-taking behaviour of banks in Ghana.

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