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## Article

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## ACCOUNTING, CORPORATE GOVERNANCE & BUSINESS ETHICS | RESEARCH ARTICLE

# Examining the effect of board size on credit risk of universal banks in Ghana

Dr Emmanuel Debrah<sup>1\*</sup>, Dr Alexander Preko<sup>2</sup> and Seth Ampadu<sup>3</sup>

**Abstract:** This study examines the effect of board size on credit risk with bank ownership, bank size and bank age acting as controls for the first time in the Ghanaian Banking Sector. Using Quantile Regression modelling, data was obtained from 12 universal Banks in Ghana over the period from 2011 to 2018 for the study. Agency theory was used since conflicts that exist between managers and shareholders need to be mitigated via the use of suitable corporate governance mechanism in the form of board size. The findings revealed that a universal bank with a small board size is not likely to reduce credit risk. Thus, the study established the importance of having large boards which are independent of management of universal banks in Ghana: large boards may enhance credit assessment and monitoring thereby reducing credit risk. The study used only quantitative techniques; however, using qualitative method in addition to the quantitative approach might enhance the understanding of the effect of board size on credit risk of universal banks in Ghana. Besides, the study relied on secondary data, though it is empirically established that there are biases inherent in such data.

**Subjects:** Economics; Finance; Business, Management and Accounting

**Keywords:** Board Size; Credit Risk; Quantile Regression; Universal Banks; Agency Theory

### 1. Introduction

The collapse of banks and other financial institutions as a result of weak corporate governance structures could exacerbate unemployment situations and hence the poverty levels among the citizenry of nations including Ghana (Chidziva, 2016; Nworji et al., 2011). According to Adams and Mehran (2003), banks generally have large boards due to their convoluted organizational structure and presence of more committees like credit risk and audit committees. There is a significant evidence that the size of the board plays a substantial role in corporate governance hence such mechanism has received a considerable attention in recent years from academics, regulators, market observers and continues to receive significant attention since empirical evidence of the effect of board size on corporate entities' performance is inconclusive (Biswas et al., 2018; Fan et al., 2011; Haddad et al., 2011; Marte Uadiale, 2010; Mayur & Saravanan, 2017; Rodriguez-Fernandez et al., 2014). Cheng et al. (2008) indicate that the importance of the board size is well acknowledged in corporate governance procedures and the quality of deliberations among board members as well as the ability of the board to achieve the best corporate governance decisions is influenced by the size of the board (Agyei-Mensah, 2018; Bello, 2012; Dao & Pham, 2015; Fan et al., 2011; Jackling & Johl, 2009; Magembe et al., 2017; Shivdasani & Zenner, 2004).

The Securities and Exchange Commission of Ghana (SEC (2010)) Code of Best Practices indicates that the board size of banks and other entities ought to be arrived at with the focus of promoting the board's effectiveness and to enhance corporate performance; nonetheless, no specific number is set by the code (SEC, 2010) with regards to board membership for public listed companies. However, the code indicates between eight to sixteen members to be ideal for effective monitoring and control for the enhancement of corporate performance. According to Vafeas (2000), corporate bodies with smaller boards of a minimum of five members were better informed about the earnings of the companies and therefore regarded as having better monitoring abilities thereby enhancing their performance. Nomran and Haron (2019) argue that small board size is better for corporate entities as it provides better communication thereby enhancing the effectiveness of corporate bodies. Thus, reducing the board size to a reasonable level is widely believed to improve the performance of banks (Nyamongo & Temesgen, 2013).

Lending is one of the core undertakings of universal banks and the total interest income from loans is established to be a major contributor to the lucrativeness of banks globally (Alodayni, 2016; Ben Saada, 2018; Bhaumik & Piesse, 2008; Moussa, 2019). The capacity of borrowers to redeem their loans and hence ensure the stability and liquidity of the banking sector is a major concern to all shareholders and other stakeholders (Ahmad et al., 2016; Alexandri & Santoso, 2015; Wijewardana & Wimalasiri, 2018). Therefore, credit risk, which is deemed as the risk of loss because of debtors' non-payments of the principals or interests on loans or specific line of credits, must be prudently evaluated and managed professionally by lending institutions at all times (Basel Committee on Bank Supervision, 2015; Ben Saada, 2018). The Basel Committee on Bank Supervision (2015) posits that nonperforming loans (NPLs) of banks is acknowledged as the main feature of the liquidity panic in the US financial system and the world-wide economic crisis of 2008 and such risk must be appropriately and discreetly managed by financial institutions in order to thwart future economic crunch for the stability of the financial systems of global economies (Asiama & Amoah, 2019; Badawi, 2017; Moussa, 2019).

It must be highlighted that the loan quality in the Ghanaian banking industry remains a source of concern as the NPLs remain high. According to the Country Report (2009–2018) from International Monetary Fund (IMF), Ghana chronicled a relatively high nonperforming loan ratios from 2009 to 2018 as 16.2%, 17.6%, 14.4%, 13.6%, 12.6%, 15.4%, 17.8%, 18.9%, 22.5% and 20.4% respectively (IMF Ghana Report, 2009–2018).

### **1.1. Problem statement**

Even though, an extensive literature has emerged concentrating on the effect of corporate governance on firm performance and the conflict of interest between managers and shareholders (all with mixed results) following the agency model (Jensen and Meckling, 1976; Adeabah et al., 2018; Darko et al., 2016; Mersni & Ben Othman, 2016; Tornyeva & Wereko, 2012), few studies have actually tried to examine the effect of board size on credit risk of universal banks and this study aims to add to literature on the effect of board size on credit risk of universal banks in the Ghanaian context.

## **2. Literature review**

### **2.1. The agency theory**

The agency theory has been extensively used to explain the various governance issues globally and it has been touted to have originated from Adam Smith's "Wealth of Nations" (Bosse & Phillips, 2016). The theory is grounded on the existence of separation of ownership and control in corporate entities where managers (agents) are appointed to work and make decisions on behalf of their owners (principals) with the aim of maximizing returns thereby creating value for shareholders (Jensen and Meckling, 1976; Fama, 1980). The agency theory is important to this study since conflicts that exist between managers and shareholders need to be mitigated via the use of suitable corporate governance mechanisms in the form of board size among others for the

effective and efficient management of banks and other financial institutions in order to ensure the maximization of shareholder value since the usage of the theory will go a long way to improve credit risk management thereby reducing nonperforming loans in the banking industry in Ghana.

The theory posits that, smaller board is recommended to ensure the minimization of agency costs and enhance effective control over management whereas large boards might increase potential interactions and conflicts among the board members (Jensen and Meckling, 1976; Fan et al., 2011; Shettima & Dzolkarnaini, 2018). When a company is managed and controlled by some people other than the owners, the intentions of the owners are likely to be subordinated to the managers' (Alalade, 2015) hence the need for strategic structures like a board to monitor, direct, control and observe the managers in order to thwart any actions that will not benefit the shareholders (Mamun et al., 2013). Agency theoreticians maintain that there is a goal conflict between the principal and the agent as both want to maximize their utility (Fama, 1980; Niskanen & Niskanen, 2012) hence the centre of the theory hinges on the belief that the interests of the principals and managers differ (Jensen and Meckling, 1976; Dawar & M. Hull, 2014) as corporate managers may have personal objectives that conflict with the shareholders' aim of wealth maximization (Jensen and Meckling, 1976).

## **2.2. Board size**

Internal corporate governance mechanisms like board size is solely dependent on internal decisions of corporate organizations (Agrawal & Knoeber, 1996; El-Mtehd, 2007; Sheikh et al., 2013). Board size refers to the number of directors constituting the boards of corporate entities (Pathan, 2009; Shakir, 2011; Adusei et al., 2014; Arora & Sharma, 2016b; Fan et al., 2011). Alam et al. (2020) established that board size has a significant negative effect on earnings management of both Islamic and conventional banks.

## **2.3. Credit risk**

The strength of a banking sector depends largely on sound banking system and failures of banks can dislocate the economic growth and development of a country (Castro, 2013; Chaibi & Ftiti, 2015; Rufai, 2013). According to Basel Committee on Bank Supervision (Basel Committee on Bank Supervision, 2015), the main cause of severe banking problems continues to be directly related to credit risk which the committee defines it as a potential that a bank's borrower/counterparty will fail to meet their obligations in accordance with agreed terms. For most banks, loans are the leading source of credit risk; nonetheless, other sources of credit risk exist throughout the activities of a bank including financial futures, equities, commitments and guarantees (Basel Committee on Bank Supervision, 2015). Since the exposure to credit risk remains a leading source of problems in banks globally, board of directors of banks and their managers should be able to learn valuable lessons from past experiences and strategise to identify, measure, monitor and control credit risk and determine that banks hold adequate capital against such risk and that they are adequately compensated for risks incurred (Basel Committee on Bank Supervision, 2015; Castro, 2013). As an emphasis, credit risk is considered as the exposure faced by banks and other financial institutions when a borrower defaults in honouring debts obligations on due date (Chaibi & Ftiti, 2015; Faleye & Krishnan, 2017; Marcucci & Quagliariello, 2008). It must be noted that, credit failures in banks affect their liquidity, cash flows and any increase in nonperforming loans of banks negatively impacts on the profitability of banks, all else being equal (Dao & Pham, 2015; Kaaya & Pastory, 2013; Oluwafemi, Adeusi, 2013). Fofack (2005), Nkusu (2011), Dahl (2013), and Kjosevski and Petkovski (2016) consider credit risk as the risk banks face in terms of nonperforming loans. A loan is termed nonperforming if the principal and/or the interests on the loans have not been paid as agreed per the loan contract. Nonperforming loans have also been described as problem loans, impaired, bad and unhealthy loans (Dahl, 2013; Fofack, 2005; Kjosevski & Petkovski, 2016; Nkusu, 2011). Badawi (2017) indicates that there is higher bankruptcy risk with banks with high credit risk and Bhattarai (2016) considers credit risk as the probability that some of a bank's assets, especially its loans, will decline in value and probably become worthless.

Credit risk has been measured differently in the literature which include: the ratio of impaired loans to gross loans (Chaibi & Ftiti, 2015); the ratio of nonperforming loans to total loans (Castro, 2013; Magembe et al., 2017); loan loss reserve to portfolio at risk (Murage, 2016) and the amount of nonperforming loans (Badar et al., 2013; Hamza, 2017; Nyor & Mejabi, 2013). Other measures of credit risk in the literature include: the ratio of loan loss provision to total assets (Garr, 2013); probability of default, loss given default and loan charge offs (Festić et al., 2011) and ratio of nonperforming loans to total loans and advances (Hymore et al., 2012).

The researchers adopt the ratio of nonperforming loans to total loans as the measure of credit risk in this study. The main reason for this choice is that this indicator of credit risk has attracted the attention of international organisations like the IMF to the extent that it is strongly associated with the likelihood of bank failures (Adusei et al., 2014; Boussaada & Labaronne, 2015). Besides, the IMF and the World Bank refer to this indicator to evaluate a country's financial stability (Adusei et al., 2014) and this measure is supposed to be a good pointer of the quality of banks' loans (Boussaada & Labaronne, 2015).

#### **2.4. Board size and credit risk effect**

A study by Abdulai et al. (2020), revealed that large board size has negative and significant influence on loan portfolio at risk and default risk in financial institutions. However, other studies indicate that large boards bring about coordination costs and free-rider problems (Olayiwola, 2018; Shahwan, 2015; Topak, 2011) as well as decision making and holding regular meetings can be difficult, all else being equal (Shahwan, 2015; Wanyonyi & Tobias, 2013). Thus, the generally shared view regarding large board size is that the greater the number of directors sitting on the board, the poorer is the performance of the company as it is premised on the belief that effective communication, coordination of tasks and decision making among a large group of people is harder and costlier than it is in smaller groups (Nyamongo & Temesgen, 2013).

There are mixed results in empirical findings for the effect of board size and corporate performance (Pathan, 2009; Shakir, 2011; Hadded et al., 2011; Fan et al., 2011). Wang et al. (2012) investigated the effect between board size and financial performance of 68 US bank holding companies over the period 2005–2007 and found a negative relationship between board size and bank profitability. Pathan (2009), by using a sample of 212 large US banks over 1997–2004 and several indicators of bank risk, found that board size is negatively related to risk taking and Minton et al. (2012) also found a negative effect between board size and bank performance. These researchers argue that smaller boards promote critical, genuine and intellectual deliberations and involvement among members which leads to effective corporate decisions thereby improving corporate performance (Bokpin, 2016; Karkowska & Acedański, 2019; Kumar & Singh, 2013; Nyamongo & Temesgen, 2013; Shakir, 2011; Shawtari et al., 2017). Also, Berger et al. (2014) found a negative but statistically insignificant relationship between board size and probability of default.

In contrast, some studies have revealed a positive relationship between board size and corporate performance as measured by Return on Asset (ROA), Return on Equity (ROE), Tobin's Q, risk management, among others (Adeabah et al., 2018; Ahmad et al., 2016; Dalton & Dalton, 2005; Shawtari et al., 2017). A study by Shettima and Dolkarnaini (2018), on the relationship between board characteristics and 30 microfinance banks performance in Nigeria from 2010 to 2013 documented a positive and significant relationship between board size and financial performance and from their findings, larger board size signifies good corporate governance practice which leads to a reduction in agency costs (Adams & Mehran, 2003; Jackling & Johl, 2009; Trinh et al., 2015).

It must be noted that the findings of other studies showed no significant correlation between larger or smaller board size and corporate performance (Dulewicz & Herbert, 2004; Topak, 2011; Wintoki et al., 2012). The mixed results from the literature indicate that there is no consensus as to whether larger or smaller boards are better to monitor corporate entities. Thus, the board size is

mainly concerned with the board's ability to monitor and control managers to ensure value maximization of banks and other corporate bodies. Therefore, if monitoring and control activities of the board are well executed, it is more likely managers' actions will be well controlled thereby reducing agency costs and credit risk for an enhanced performance of banks and other corporate entities. Considering the above viewpoints from literature, the following hypothesis is formulated by the researchers:

*H1: Board size is negatively related to credit risk of universal banks in Ghana.*

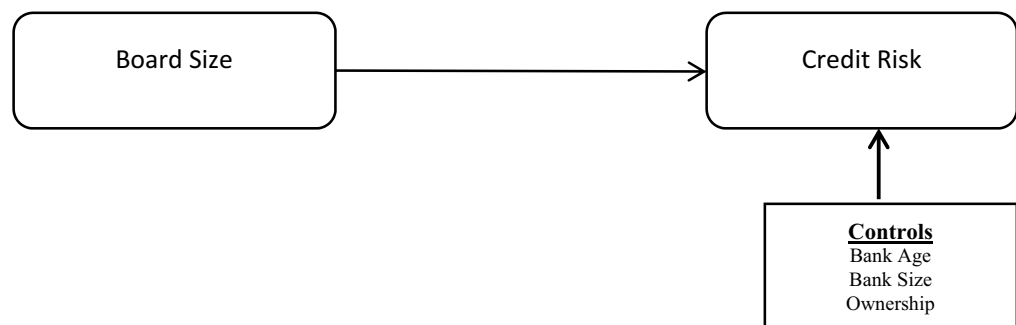
From the above discussions and the indicated hypothesis, the conceptual framework of the study is diagrammatically presented in Figure 1:

### 3. Methodology

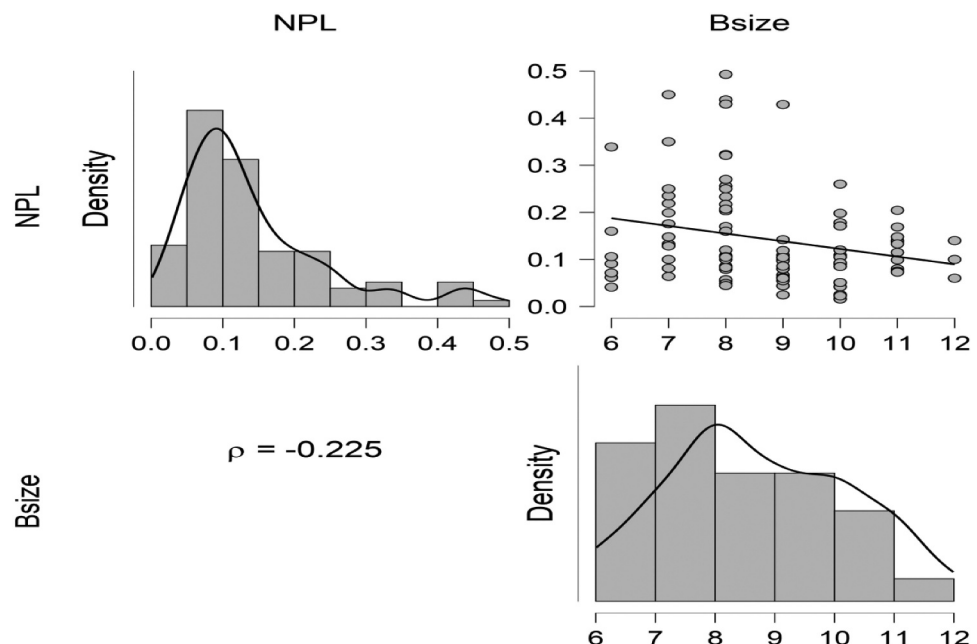
#### 3.1. Research approach

This study adopts quantitative approach in examining the effect of board size on credit risk of universal banks in Ghana. This approach facilitates the quantification of attitudes, opinions and other defined variables and generalize results from a larger sample population (Clark & Creswell,

**Figure 1. Conceptual model predicting the direct effect of Board size on credit risk, controlling the confounding effect of bank age, bank size and ownership.**



**Figure 2. Spearman rho correlation matrix plot.**



2014). The chosen approach is justified since it provides a framework for the collection of numerical data and then subsequently adopting statistical model(s) to estimate the nature and strength of association between a set of dependent variables (Credit risk—NPL) and independent variables (board size) (Clark & Creswell, 2014).

### 3.2. Sampling technique and selection criteria

In this study, a convenience sampling technique was used to select a sample of 12 universal banks for the study. The sampled universal banks (made up of 7 foreign and 5 locally owned banks) were selected based on the following criteria as used by other researchers (Ali, 2014; Cheng et al., 2008): (i) availability of at least 8 full set of annual reports from 2011 to 2018; (ii) financial statements for the period from 2011 to 2018 have been audited and are available on the banks' websites for all stakeholders; (iii) the banks must have operated over 10 years within the study period and (iv) the banks consistently communicate their corporate governance mechanisms in their annual reports from 2011 to 2018.

### 3.3. Econometric model

The following empirical model is constructed to examine the effect of board size on different quantile levels of credit risk of universal banks in Ghana:

$$NPL_{t+1,q} = \beta_{0q} + \beta_{1q} BSize + \beta_{7q} BnkSize + \beta_{8q} BAge + \beta_{9q} Owshp + \varepsilon_t$$

Where  $q$  indicates a percentile in the conditional distribution of the dependent variable (credit risk = NPL).

### 3.4. Measurement of variables

The variables used in the model and their measurements are presented in Table 1:

### 3.5. Data analytic approach

#### 3.5.1. Quantile regression

In this study, the researchers use a type of regression technique known as Quantile Regression (QR) to analyse the effects of Board size on credit risk of universal banks in Ghana. QR method was introduced by Koenker and Bassett (1978) as an extension of the ideas of conditional mean in the context of ordinary least squares (OLS) to the conditional quantiles as functions of predictor variables. Thus, QR is considered to be more powerful statistical technique than the standard linear OLS regression by producing separate estimates for all conditional quantiles of a response variable(s) distribution (Koenker, 2015; Koenker & Bassett, 1978). This is different from OLS regression which estimates only a conditional mean effect of a response variable (Koenker, 2015). Thus, QR method allows researchers to identify the effects of the covariates at different locations in the conditional distribution of the dependent variable.

Added to the above, QR works well under assumptions more relaxed than those associated with OLS regression: being able to handle skewed data, unequal variance (heteroscedasticity) and existence of outliers (Koenker, 2015). Since OLS estimates the mean of a response variable, the distribution of this response variable's data should be normal (which implies a symmetric and bell-shaped distribution with thin tails) in order to produce linear, unbiased and efficient estimators (Tsionas, 2019). More generally, strict assumptions as to normality, homoscedasticity and absence of outliers should be fulfilled to perform OLS regression (Tsionas, 2019; Wooldridge, 2010). As an emphasis, QR provides a more comprehensive and complete picture of the set of relationships between a dependent variable(s) and independent variables, depending upon the value of the dependent variable (Koenker, 2015; Koenker & Bassett, 1978). It is worth mentioning that with QR

**Table 1. Measurement of studied variables**

Variable	Notation	Data Source	Measurement	Literature Support
<b>Dependent variable:</b>				
Credit Risk	NPL	Annual Reports and Audited Financial Statements	The ratio of non-performing loans to total loans at end of each year	Castro (2013); Magembe et al. (2017)
<b>Independent variable:</b>				
Board Size	BSize	Annual Reports	The number of directors on the board at the end of each year	Adusei et al., (2014); Shawtari et al. (2017); Adeabah et al. 2018; Shettima and Dzolkarnaini (2018).
<b>Control variables:</b>				
Bank Age	BAge	Websites, Annual Reports	Number of years since the bank started operating.	Ayadi et al., (1998); Shumway (2001).
Bank Size	BnkSize	Annual Reports, Audited Financial Statements.	Natural logarithm of bank total assets.	Kyereboah-Coleman and Biekpe (2006); Adusei et al. (2014).
Ownership	Owshp	Annual reports	A binary variable: 1 if bank is locally owned and 0 if it is foreign owned.	Mori and Towo, 2017; Mohammed, 2018.

all sample observations are used in the process of a Quantile-fitting regression (Koenker, 2015). The researchers intend to estimate the 25<sup>th</sup>, 50<sup>th</sup>, 75<sup>th</sup> and 90<sup>th</sup> quantiles in order to obtain a much more view of the potential effect of board size on credit risk of universal banks in Ghana. Thus, compared with OLS, QR can obtain more information about points in the conditional distribution of the dependent variable which a standard regression model cannot provide (Koenker, 2015).

#### 4. Results

As reported in Table 2, the mean and standard deviation values of NPL are 0.14 and 0.10 respectively. The mean value of NPL of 0.14 is comparable to the IMF Ghana Report 2011 which indicated a high nonperforming loans of 0.14 in 2011. As depicted in Table 2, the mean value of board size of the sampled universal banks in Ghana is 9 with a minimum and maximum values of 6 and 12 respectively. According to Mukherjee et al., (2013) and Tsionas (2019), data are normally distributed if the value of skewness is 0 and kurtosis is lower than 3. If skewness is 0, the distribution of the data is symmetric and if kurtosis is lower than 3, the tails of the data are thin (Mukherjee et al., 2013). From Table 2, it can be observed that the skewness value of all variables is not 0 which indicates that the variables are not symmetrically distributed. This signals observations with extreme values justifying the use of QR as a nonparametric statistics. Spearman rho Correlation Matrix Plot is presented in figure 2.

Table 3 shows that board size (Bsize) negatively correlates with credit risk (NPL) at 5% significant level ( $r = -0.225$  and  $p < 0.05$ ).

**Table 2. Descriptive statistics of dependent, independent and control variables**

	NPL	Bsize	OwshipC	BnkSizeC	BAgeC
Mean	0.143	8.74	0.417	9.35	33.3
Mode	0.1	8	0	9.53	7
Sum	13.7	839	40	897	3192
Standard deviation	0.103	1.56	0.496	0.332	30.7
Inter Quartile Range	0.098	2	1	0.438	32.8
Minimum	0.016	6	0	8.45	3
Maximum	0.493	12	1	10	122
Skewness	1.56	0.139	0.343	-0.218	1.73
Kurtosis	2.23	-0.763	-1.92	-0.246	2.48

Source: Researchers' field data: results extracted from STATA IC/15

**Table 3. Spearman rho correlation matrix (non-parametric test)**

		NPL	Bsize
NPL	Spearman's rho	—	
	p-value	—	
Bsize	Spearman's rho	-0.225*	—
	p-value	0.027	—

Note. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

#### 4.0.2. Spearman rho correlation matrix plot

##### 4.1. Quantile regression results

To estimate the effect of board size on credit risk of universal banks in Ghana, a QR analysis was carried out. QR was adopted because it allows researchers to consider the effects of the independent variables (IV) on the entire distribution of the dependent variable (DV; Koenker, 2015; Koenker & Bassett, 1978). Further, QR does not need strict assumptions like normality, homoscedasticity or absence of outliers which are required in classical linear regression (Koenker, 2015).

Table 4 reveals that board size shows a negative coefficient of 0.009 and a p-value of 0.117 at 0.25 quantile data point; similar results are observed at quantile 0.50 ( $\theta = -0.011$  and  $p = 0.172$ ). However, at quantiles 0.75 and 0.90, p-values are statistically significant (where  $p = 0.009$  and  $p = 0.005$  respectively) with negative coefficients of 0.030 and 0.049 in that order.

##### 4.2. Hypothesis of the study

Table 5 shows the hypothesis testing results of the study of board size and credit risk (NPL) of universal banks in Ghana.

#### 5. Discussions and implications

The findings reveal that a universal bank with a smaller board size is not likely to reduce credit risk. This confirms the findings of Bello (2012) and Fan et al. (2011) that corporate entities including banks benefit immensely from superior monitoring effort by having larger boards. Thus, it is established that large and diversified board members have a range of expertise and experiences in various areas including credit monitoring and risk management and could provide high quality advice on credit issues thereby making better credit decisions for the enhancement of shareholder value (Andres & Vallelado, 2008; Fan et al., 2011; Fiador & Sarpong-Kumankoma, 2020; Gouiaa, 2018; Klein, 2002; Zahra & Pearce, 1989). Besides, it

**Table 4. QR results for 0.25, 0.50, 0.75 and 0.90 quantiles**

	NPL	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
<b>25th Quantile</b>							
	Bsize	−0.009	0.005	−1.580	0.117	−0.019	0.002
	BnkSizeC	−0.027	0.027	−1.010	0.316	−0.080	0.026
	BAgeC	0.001	0.000	4.360	0.000	0.001	0.002
	Owship	−0.003	0.017	−0.180	0.857	−0.037	0.031
	_cons	0.367	0.243	1.510	0.135	−0.117	0.850
<b>50th Quantile</b>							
	Bsize	−0.011	0.008	−1.380	0.172	−0.026	0.005
	BnkSizeC	−0.023	0.038	−0.620	0.534	−0.098	0.051
	BAgeC	0.002	0.000	4.130	0.000	0.001	0.002
	Owship	−0.017	0.024	−0.710	0.477	−0.065	0.030
	_cons	0.384	0.343	1.120	0.266	−0.297	1.065
<b>75th Quantile</b>							
	Bsize	−0.030	0.011	−2.660	0.009	−0.052	−0.008
	BnkSizeC	−0.013	0.055	−0.230	0.815	−0.121	0.096
	BAgeC	0.002	0.001	4.030	0.000	0.001	0.003
	Owship	−0.026	0.035	−0.750	0.456	−0.095	0.043
	_cons	0.500	0.498	1.000	0.318	−0.489	1.490
<b>90th Quantile</b>							
	Bsize	−0.049	0.017	−2.880	0.005	−0.083	−0.015
	BnkSizeC	0.094	0.083	1.130	0.263	−0.072	0.259
	BAgeC	0.001	0.001	1.450	0.149	0.000	0.003
	Owship	0.020	0.053	0.380	0.707	−0.085	0.125
	_cons	−0.224	0.760	−0.290	0.769	−1.734	1.286

**Table 5. Hypothesis testing based on 25th, 50th, 75th and 90th quantile levels**

	NPL	Coef.	P> t	Decision	Alternative Decision
<b>25th Quantile</b>					
	Bsize	−0.009	0.117	Accepted	Reject Null Hypothesis
<b>50th Quantile</b>	Bsize	−0.011	0.172	Accepted	Reject Null Hypothesis
<b>75th Quantile</b>	Bsize	−0.030	0.009	Accepted	Reject Null Hypothesis
<b>90th Quantile</b>	Bsize	−0.049	0.005	Accepted	Reject Null Hypothesis

could be explained that larger boards are difficult to be controlled by a “powerful Chief Executive Officer”, hence the board is able to make better credit decisions for the banks, *ceteris paribus*. The finding also confirms the agency theory’s notion that large boards of banks may be better placed to subject managerial and credit approval decisions to greater scrutiny and monitoring which tends to improve the credit risk management of universal banks in Ghana (Jensen and Meckling, 1976; Bhatt & Bhatt, 2017; Bhattarai,

2016). Arguably, larger board size is effective in the Ghanaian banking context hence such board size should be encouraged for reduction in credit risk in the various universal banks in Ghana. This implies that large board size of banks facilitates sharing of ideas, expert credit analysis and decisions which might increase the likelihood of better credit risk management thereby reducing default risk for enhanced financial performance of the banks.

Moreover, the evidence of the negative and statistically significant effects of board size on the top quantiles (i.e. 0.75 and 0.90) of credit risk distribution illustrates that universal banks in Ghana with high credit risk need more experienced directors with various skills in monitoring and supervising executive management to ensure they strictly follow the banks' credit policies in order to reduce credit risk. Another possible explanation of the effectiveness of large boards to reduce credit risk of banks is imbedded in their capacity to discharge the strategic function of banks efficiently compared with smaller boards since strategic function is crucial during periods of high credit risk (Berger et al., 2014; El-Masry et al., 2016). Thus, smaller boards are less diverse and in situations of high credit risk, may be ineffective in taking critical credit decisions in order to reduce credit risk. Besides, it is argued that small boards are more susceptible to CEO hegemony suggesting that an entrenched CEO may overturn board credit decisions in furtherance of their interest thereby increasing the credit risk of the universal banks, all else being equal (Gouiaa, 2018; Rose, 2017). The finding further reveals that large boards provide banks with skillful directors with the abilities to appraise credit proposals and hence ensure quality assets in order to enhance shareholder value.

In relation to prior research, the finding of this study is in line with the result of El-Masry et al. (2016), who found a negative effect between board size and probability of default since more directors may add skills, experience and knowledge which tends to enhance the credit risk management of banks, all other things being equal. The Present study however, differs to some extent from the work of El-Masry et al. (2016). This is probably because these researchers used sample of 900 observations from banks in the Gulf countries over the period from 2003 till 2012; however, the present study used sample of 96 observations from universal banks in Ghana over the period from 2011 till 2018. Further, the present study possibly provides support for the persistent use of the agency theory as an analytical device through which to study the effectiveness of board size as a monitoring and strategic mechanism in the corporate governance and credit risk context.

## 6. Research limitations

Though the study provided some useful information about board size and credit risk of universal banks in Ghana, the findings of the study may be interpreted and concluded on probable decisions with caution due to the fact that, the study used only quantitative techniques in collecting and analyzing its data. Besides, the study relied on secondary data, though it is empirically established that there are biases inherent in such data (Gorard, 2002).

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