PREDICTING BANK CREDIT RISK: DOES BOARD STRUCTURE MATTER?

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ABSTRACT

The study investigates the predictors of credit risk in the universal banking industry with panel data from universal banks in Ghana and finds that leverage, assets (size), loan loss provision, board size, board independence, and the number of executive directors on the board of a bank are the predictors of its credit risk. Based on these results, the study concludes that board structure matters in credit risk management of universal banks in Ghana. The recommendation is that banks could improve their credit risk management by formulating policies around these factors.

JEL: E5, G21, G34, N27

KEYWORDS: Bank Credit Risk, Board Structure, Ghana

INTRODUCTION

As depositary institutions taking deposits from the savings surplus units and making them available to savings deficits units at a profit, universal banks, among other things, promote entrepreneurship which ultimately culminates in the socio-economic development of an economy. However, in discharging this financial intermediation role, universal banks are confronted with the herculean task of managing risks. One of these risks is credit risk. Credit risk simply means the probability that the borrower will fail to honor the terms of the loan agreement. This risk is usually exacerbated by the phenomenon of information asymmetry which creates adverse selection and moral hazard. Banks usually manage this phenomenon by instituting effective and efficient loan appraisal systems supported by aggressive loan recovery systems.

That the development of the financial system including the banking sector promotes economic growth is well documented in the literature (Ono, 2012; Jalil and Feridun, 2011; Esso , 2010; and Levine, Loayza and Beck, 2000; King and Levine, 1993). However, the development of the financial sector especially the banking sector has also been documented to undermine economic growth (Adusei, 2013a, b; Adusei, 2012; Chow and Fung, 2013; Hye and Islam 2013; Liang and Reichert, 2012). The banking and currency crisis literature explains the negative relationship between financial development and economic growth in terms of over-lending or careless lending which normally emanates from over-liberalization of the financial sector (e.g., Gourinchas, Landerretche, and Valde´s, 2001, Kaminsky and Reinhart, 1999). This accentuates the importance of lending to economic growth. Indeed, the late 2000s financial crisis that hit the world leading to the demise of hitherto blossoming organizations was triggered by poor lending practices in the United States' banking system. The crisis had global effects. It is reported that for the first quarter of 2009, the annualized rate of decline in GDP was 14.4% in Germany, 15.2% in Japan, 7.4% in the UK, 18% in Latvia, 9.8% in the Euro area and 21.5% in Mexico. One can also mention the Asian crisis in the late 1990s. Evidence exists that the problems encountered by Asia's banking systems in the mid-1990s were the fruits of years of bad lending practices catalyzed by inadequate supervision and regulation that fertilized rapid lending growth and excessive risk taking (Lindgren, *et al*, 1999; Caprio and Klingebiel, 2003).

The evidence adduced above justify the need for macro as well as firm-level investigations into the predictors of credit risk so that proper measures can be put in place to circumvent the horrors of credit risk in the banking sector. We recognize that several studies on the determinants of bank credit risk have been done on banking systems of many economies (Ahmad and Ariff, 2007; Kraft and Ljubinko, 2005; Cebenoyan and Strahan, 2004; and Ariff and Marisetty, 2001). However, the banking industry in Ghana is yet to receive its fair share of these copious studies despite the fact that over the years some dimensions of the industry have seen much attention (Adusei, 2011; Marfo-Yiadom and Agyei, 2011, Aboagye-Debrah, 2007). To the best knowledge of the researchers the determinants of the credit risk in the Ghanaian banking industry is one of the few grey areas that are yearning for intellectual exploration. Consequently, the current study seeks to contribute to the literature on the universal banking industry in Ghana by exploring the determinants of bank credit risk with emphasis on whether board structure matters in the credit risk management process of universal banks. The main motivation behind this study is to improve the understanding of credit risk modeling at the micro level. The study is especially significant for one main reason. Unlike the previous studies which exclude the board structure factor, the current study incorporates the board structure factor in the bank credit risk analysis. The rest of the paper is structured as follows. The next section provides the review of the extant literature followed by data and methodology section. The penultimate section presents the results. The paper ends with conclusion, policy implication and limitations of the paper section.

REVIEW OF EMPIRICAL STUDIES AND HYPOTHESES DEVELOPMENT

Two schools of thought have dominated bank credit risk literature. Spearheaded by Hassan *et al*., (1994) and Corsetti *et al*., (1998), the external variables theory posits that changes in external variables in the financial markets, regulations and economic conditions affect bank risk. In a study covering OECD and Asian countries, Ariff and Marisetty (2001) find that Gross Domestic Product (GDP) is negatively related to bank risk. Ahmad (2003) has also reported a significant negative relationship between GDP and credit risk of banks in Malaysia. Recently, Ali and Daly (2010) in their comparative study of United States of America (USA) and Australian economies on the macroeconomic determinants of bank credit risk find that GDP has a negative statistically significant relationship with credit risk measured by default rate in both countries. In terms of sensitivity to macroeconomic shocks, the study reports that the USA economy is more prone to macroeconomic shocks than the Australian economy (Ali and Daly, 2010).

Internal variables theory argues that internal variables are determinants of credit risk (Berger and DeYoung, 1997; and Angbazo, 1997). Bank capital is one of the significant determinants of credit risk (Galloway *et al.,* 1997). However, Berger and DeYoung (1997) note the evidence is mixed. This is confirmed by Ahmad and Ariff (2007) in their multi-country study of bank credit risk determinants. They report that in Japan, Malaysia, and Mexico, capital is significantly positively related to credit risk. They attribute the reason for their finding to the requirement from banks to increase their capital as a cushion to absorb potential losses that might arise from an increase in credit risk. On the other hand, the researchers report a significant negative relationship between bank credit risk and capital in Australia and India, articulating that their finding supports the assertion that under-capitalized banks take more risks. Their finding reinforces that of Berger and DeYoung (1997) and deepens the controversy over the relationship between capital and bank credit risk. Notwithstanding the mixed evidence, the following hypothesis is tested:

H_1: Bank capital positively correlates with bank credit risk

Evidence on the relationship between leverage and credit risk is mixed. Whereas in the USA, Galloway, Lee and Roden (1997) found operating leverage to be positively related to risk in pre-deregulatory period but negatively related to credit risk in de-regulatory periods, Ahmad and Ariff (2007) found leverage as irrelevant to credit risk of banks in several economies they studied. Thus, the following hypothesis is tested:

H_2: Bank Leverage positively correlates with its credit risk

It is reasonable for one to argue that if total loans to total deposits ratio of a bank increases its credit risk increases. This argument has empirical support. Ahmad and Ariff (2007) have reported that loans to deposit ratio is a significant positive determinant of credit risk in Malaysia, the USA., and France. This leads to the following hypothesis:

H_3: Bank loan portfolio relative to deposit size positively correlates with bank credit risk

The spread of a bank which represents the net interest margin of the bank has been found to be a determinant of bank credit risk but the empirical studies provide mixed evidence. Ahmad and Ariff (2007)'s study provides evidence of negative correlation for banks in India and Thailand but positive correlation for banks in France. The following hypothesis is to be tested:

H_4: Bank spread negatively correlates with bank credit risk

The work of Bikker and Metzemakers (2005) reveals that bank provisioning behavior is related to business cycle. They find that banks make substantially higher provisions against potential loan loss or higher credit risk when GDP growth is low. It is, therefore, reasonable to conclude that higher loan loss provision indicates higher credit risk potentials of a bank. This leads to this hypothesis:

H_5: Bank loan loss provision is positively related to its credit risk

Indeed several variables have been found to have some correlation with credit risk: size (Hassan et al. 1994); and management efficiency (Ahmad and Ariff, 2007 and Angbazo, 1997). According to Angbazo (1997) earning assets to total assets ratio reflects a bank's management efficiency in managing its assets to earn interest income. The following hypotheses are to be tested:

H_6: Bank total assets (size) positively correlate with its credit risk

H_7: bank earning assets to total assets ratio positively correlates with its credit risk

Studies on corporate boards have always modeled two specific elements of the boards: board size and board composition (i.e. independent directors) as points of reference (Pathan and Skully, 2010). Board size refers to the headcount of directors constituting the board of an entity. Klein (2002) and Andres and Vallelado (2008) argue that a large board size should be preferred to a small size because of the possibility of specialization for more effective monitoring and advising functions. However, Fama and Jensen (1983); Lipton and Lorsch (1992); and Yermack (1996) have proffered counter argument that the benefit of specialization which Klein (2002) and Andres and Vallelado (2008) emphasize may be swallowed by the incremental cost of poorer communication and decision-making associated with larger groups. Jensen (1993) who is one of the proponents of small board size school of thought has questioned the effectiveness of boards with more than about seven to eight members, arguing that such boards are not likely to be effective. He advances that large boards result in less effective coordination, communication and decision making, and are more likely to be controlled by the Chief Executive Officers of such firms. His hypothesis has since received empirical corroboration from studies by Yermack (1996) and Eisenberg et al. (1998). Eisenberg et al. (1998), in particular, find a significant negative correlation between board size and profitability in a sample of small and midsize Finnish firms. Cheng (2008) also lends credence to Jensen's hypothesis. His study provides empirical evidence that firms with larger boards have lower variability of corporate performance. Switzer and Wang (2013) examine the impact of corporate governance variables on bank credit risk. After controlling for firm-specific characteristics, the study provides evidence that

commercial banks with larger boards and older CFOs are associated with significantly lower credit risk levels (Switzer and Wang, 2013). This leads to the following hypothesis:

$H_{8:}$ Bank board size negatively correlates with bank credit risk

There is a school of thought that argues that effective boards consist of greater proportions of outside directors. Arosa et al. (2010); Ezzamel and Watson (1993); and Lorsch and MacIver (1989) are members of this school of thought. Their studies have reported a positive relationship between independent directors and firm performance.Two theoretical perspectives have fueled the penchant for outside directors: the resource dependence theory and the agency theory. Spearheaded by writers such as Burt (1983) the resource dependence school of thought hypothesizes that outside directors are a critical link to the external environment of the firm. Such board members, in the view of the proponents, may provide access to valued resources and information especially in times of adversity (Sutton and Callahan, 1987). Agency theory (Eisenhardt, 1989, and Jensen and Meckling, 1976) argues that due to the separation of ownership and control in modern organizations which creates information asymmetry between corporate owners and managers, the latter are likely to feed fat on the amount and quality of the information they have by engaging in self-serving ventures that are injurious to the interest of the former. One of the primary duties of the board of directors, the theory submits, is to serve as the monitoring agent for shareholders to check the behavior of corporate managers (Fleischer et al., 1988). Therefore, having an insider-dominated board of directors is likely to aggravate the situation as the board's role as a monitoring agent of shareholders will be attenuated, paving way for managers to undermine shareholders' wealth maximization. Thus, the agency theory maintains that effective boards will consist of outside directors. However, there are studies that challenge this view. Zahra and Stanton (1988) have found no relationship between board composition and firm performance. Thus, this hypothesis is to be tested:

$H_{9:}$ Bank board independence negatively correlates with bank credit risk

Running counter to the resource dependence and agency theories of outside directors is the stewardship theory which argues that managers are inherently trustworthy and are not susceptible to the abuse of corporate resources (Pieper et al., 2008; Donaldson and Davis, 1994). Indeed, Donaldson and Davis (1994) suggest that 'managers are good stewards of the corporation and diligently work to attain high levels of corporate profit and shareholder returns.' The theory affirms that the main role of the board of directors is to advise and support management rather than to discipline and monitor, a view which runs counter to the agency theory. The theory maintains that the relationship between board independence and firm performance potentially exists due to the counsel and advice that outside directors offer, rather than their monitoring and control activities (Anderson & Reeb, 2004). In effect the stewardship theory advocates a greater proportion of executive directors. In consonance with stewardship theory, some studies have found that inside directors are associated with higher firm performance. In a study of *Fortune* 500 corporations, Kesner (1987) reports a positive and significant relationship between the proportion of inside directors and returns to investors. Vance (1978) has also reported a positive association between inside directors and firm performance. This leads to the following hypothesis:

$H_{10:}$ Bank inside directors negatively correlate with bank credit risk

RESEARCH METHOD

This section chronicles how the study was undertaken. It describes the econometric model employed, the sample and the data sources consulted. Credit risk is the dependent variable in the model and it is defined as the non-performing loans to gross loans of a bank. In line with the studies of Anderson and Reeb (2003); De Andres et al. (2005); Jackling and Johl, 2009) board size is measured using the natural logarithm of the

total number of members of the board of directors. Board composition construed as board independence (BINDEPEND) is measured as the proportion of non-executive directors on the board of a bank. Independent director has been defined as one that could get a seat in the board without the controlling shareholder's votes (Lefort and Urzúa 2008). Stewardship theory is tested by including the natural logarithm of executive members (INSID) on the board of a bank. Other explanatory variables are the size of a bank (ASSETS) which is calculated as the natural logarithm of the total assets (Barontini and Caprio, 2006); capital (CAP); leverage (LEV); spread (SPREAD); loans to time deposit ratio (LD); loan loss provision to gross loans ratio (LLP); and earning assets to total assets ratio(MGT). The panel data model for relating a dependent variable to independent variables is compactly stated thus:

$$Y_{it} = \alpha + \beta X_{i,t} + \mu_{i,t} \quad (1)$$

Where:

Subscripts *i and t* represent the cross-sectional and the time-series dimensions of the data respectively. Y represents the dependent variable in the model which is bank credit *X* represents the set of independent variables in the estimation model μ *r*epresents the error term The primary estimation method of regression is ordinary least squares (OLS). Definitions of the variables used in the model are given in Table 1.

Table 1: Variables and Their Definitions

Variable		Definition
Dependent variable: Bank Credit Risk	=	Total non-performing loans/Total Gross Loans
		Independent Variables
Size (*Ln*ASSETS)	=	Natural logarithm of Total Assets
Capital (CAP)	=	Tier 1 capital/Total Loans
Management Efficiency (MGT)	=	Earning Assets/Total Assets
Leverage (LEV)	=	Total liabilities/Total Assets
Board Size (*Ln*BSIZE)	=	Natural logarithm of number of directors on the board
Inside Directors (*Ln*INSID)	=	Natural logarithm of the number of executive directors
Board Composition/Independence (*Ln*BCOM)	=	Natural logarithm of the number of non-executive directors
Loan Loss Provisioning Behavior (*Ln*LLP)	=	Natural logarithm of Total loan loss provisions/Total Gross Loans
Loan to Deposit Ratio (LD)	=	Total loans to Total Time Deposits
Spread (SPREAD)	=	(Total Interest Income/Total Earning Assets)- (Total Interest Expense/Total interest-bearing Liabilities

This table shows sample variables and their definitions.

A total sample of 14 out of 26 universal banks in Ghana representing approximately 54% of the study population was used in the study. Data for the study were extracted from the annual reports of the 14 banks. The website of each of the banks was visited. On the website the annual reports for the chosen period of study (2006-2010) were downloaded. Not all banks provided their annual reports for all the years under review. However, any bank that provided at least a three-year financial report was included in the study. The 12 banks excluded from the study were excluded because of the non-availability of their annual financial reports covering the study period. In all, 58 observations were obtained after editing the annual reports of the 14 banks and were, therefore, used for the study.

ESTIMATION RESULTS

This section consists of two parts: Initial results and robustness check.

Initial Results

Table 2 shows that the average credit risk in the universal banking industry is approximately 6.89%. Although this is above the international standard of 2 per cent, yet as a developing economy this is

suggestive of effective and efficient loan appraisal, monitoring and collection systems in the industry. Average capital to loans ratio is approximately 25.70 % with leverage recording 88.34% indicating banks in the industry have about one-fourth of their loans secured with capital and that they are highly geared. Loans to deposits ratio is about 438%. Spread which reflects the net interest margin of banks is about 129%, smacking of high interest rates in the industry. The average loan provision in the industry is 4.23%. The mean total assets of the industry is GH¢730,000,000 which is equivalent to US$486,666,666. The management efficiency (MGT) ratio reflects how well management is managing its assets to generate interest income. The higher the ratio the better. Thus, the mean management efficiency (MGT) ratio of 80.88% is encouraging. The average board size is 8 with board independence and inside directors recording 6 and 2 respectively. The average board size is in line with international standard. The correlations between the variables have been presented in Table 3. Except the correlation between board size and board independence which is two points above the acceptable standard of 0.80, all the other correlations fall within 0.80. In correcting this multicolinearity problem the natural logarithm of board size was used in the equation.

Table 2: Descriptive Statistics

STATISTIC	NPL	CAP	LEV	LD	SPREAD	LLP	ASSETS	MGT	BSIZE	BCOM	INSID
Mean	0.0689	0.2571	0.8834	4.3853	12.918	0.0423	730,000,000	0.8089	8.586	6.379	2.207
Median	0.0485	0.2236	0.8866	2.6033	0.0791	0.04	458,000,000	0.8327	8	6	2
Maximum	0.48	1.0094	0.9568	27.603	216.07	0.21	6,990,000,000	1.0859	14	11	5
Minimum	0.00	0.1076	0.6453	0.3548	-0.0663	0.01	19,602,200	0.4972	6	4	1
Std. Deviation	0.0712	0.1368	0.0467	5.7705	48.075	0.0335	979,000,000	0.1034	1.697	1.461	0.9507

This tables provides descriptive statistics of the variables used for the study.

Table 3: Correlation Matrix

	NPL	CAP	LEV	LD	SPREAD	LLP	ASSETS	MGT	BSIZE	BCOM	INSID
NPL	1										
CAP	0.0836	1									
LEV	-0.3130	-0.7759	1								
LD	0.0326	0.0609	-0.2849	1							
SPREAD	0.0004	-0.0017	-0.1191	-0.1305	1						
LLP	0.2394	-0.0199	-0.1111	0.0235	-0.0608	1					
ASSETS	0.1372	0.0548	-0.0007	0.0783	-0.1479	0.0811	1				
MGT	0.0749	-0.5056	0.3431	0.1352	-0.2909	4.6300	0.1951	1			
BSIZE	0.1229	-0.0040	-0.2038	0.4823	0.0061	0.0907	0.3891	0.2319	1		
BCOM	0.1188	0.0233	-0.2701	0.3587	-0.0072	0.0796	0.1003	0.1158	0.8289	1	
INSID	0.0369	-0.0431	0.0513	0.3095	0.0220	0.0396	0.5402	0.2359	0.5108	-0.0575	1

This table presents the correlations among the variables used in the study

The predictive power of the model R^2 is 54%. It means that the explanatory variables in our model explain 53% variation in the dependent variable. The significance of the F-statistic reported in Table 4 implies that the explanatory variables jointly and significantly explain the variations in the dependent variable. From Table 4 it can be observed that contrary to the literature (Ahmad and Ariff, 2007; Galloway *et al.,* 1997 and Berger and DeYoung, 1997) bank capital has no relationship with bank credit risk. The argument for the relationship between bank credit risk and bank capital is that banks rely on their capital to cushion themselves against credit losses. Thus, it is reasonable to expect that as the capital of a bank increases its credit risk also increases. However, this argument appears to be defeated in Ghana. Banks in Ghana do not increase their capital base for cushioning against credit risk. H_1 is, thus, unsupported. Table 4 shows that leverage is significantly negatively correlated with bank credit. This implies that highly leveraged banks are less likely to engage in lending operations that may exacerbate their credit risk. Hypothesis H_2, is, thus, rejected. Bank loan portfolio to time deposit ratio as well as the spread of a bank which indicates the net interest income it generates from its operations has been found to be irrelevant in determining the credit risk of the bank. Therefore, hypotheses H_3 and H_4 do not have any empirical support. There is evidence in Table 4 that the loan loss provision to total gross loans ratio has a significant positive relationship with bank

credit risk. This finding strikes a chord with the extant literature (Ahmad and Ariff, 2007; Ahmed *et al.* 1998; Ahmad, 2003 and Bikker and Metzemakers, 2005). It suggests that as the loan loss provision of a bank increases it is indicative of the deterioration of its credit risk. Hypothesis H_5 is, thus, supported. It can be explained that the officers of a bank that makes high provision for loan losses are likely to be reckless in loan appraisal, monitoring and collection thereby creating more non-performing loans in the books of the bank.

There is evidence to accept hypothesis H_6. The size of a bank proxied by its total assets has a significant, positive correlation with bank credit risk. The implication is that as a bank in Ghana grows in size its credit risk also increases. This contradicts the finding of Hassan *et al.* (1994) that bank size is significantly negatively related to risk of banks in the U.S.A. This finding is understandable in the sense that loans and advances constitute about 80% of the total assets of a commercial bank. Therefore, as a commercial bank piles up non-performing loans in its books, its total assets skyrockets thereby deteriorating its credit risk. Management efficiency measured by the earning assets to total assets ratio has no significant relationship with bank credit risk. This is contrary to the work of Ahmad and Ariff (2007) and Angbazo (1997). Hypothesis H_7 is, therefore, unsupported.

Evidence in Table 4 shows that board size is negatively related to bank credit risk. This is statistically significant. Hypothesis H_8 is, therefore, tenable. It presupposes that as a bank increases its board size, it is likely to reduce its credit risk. This finding defeats the small board theory which argues that smaller boards are more effective than their larger counterparts (Fama and Jensen, 1983; Lipton and Lorsch, 1992; and Yermack, 1996) and upholds the theory of Klein (2002) and Andres and Vallelado (2008) who argue that a large board size should be preferred to a small size because of the possibility of specialization for more effective monitoring and advising functions. Table 4 shows that board composition/independence has a positive relationship with credit risk, implying that as the number of independent directors on the board of a bank increases, there is a corresponding increase in the credit risk of the bank. Hypothesis H_9, thus, lacks empirical support.

Table 4: Estimation Results-Dependent Variable=Credit Risk

Variable	Coefficient	Std Error	t-Statistic	P-value
CAP	-1.062	1.196	-0.8875	0.3794
LEV	-9.343	3.526	-2.6499	0.0110***
LD	-0.0218	0.0171	-1.2734	0.2093
SPREAD	0.0016	0.0020	0.8098	0.4222
*Ln*LLP	0.5995	0.1228	4.8832	0.0000***
*Ln*ASSETS	0.2691	0.0981	2.7434	0.0086***
MGT	-0.1529	1.1174	-0.1368	0.8918
LnBSIZE	-5.155	2.5144	-2.0503	0.0461**
*Ln*BCOM	0.5332	0.2747	1.9409	0.0584*
*Ln*INSID)	1.230	0.5959	2.0640	0.0447**
C	10.984	4.9214	2.2321	0.0691*
R^2	0.54			
F-statistic	5.390		Prob(F-statistic)	0.000031

This table shows the results of our panel regression: $Y_{it} = \alpha + \beta X_{i,t} + \mu_{i,t}$. ****, **, * represent 1%, 5% and 10% significance levels*

Impliedly, the agency theory and the resource dependence theory of board independence appear to have lost their locus as far as credit risk is concerned. Evidence in Table 4 indicates that banks that appoint more executive/inside directors are more likely to increase their credit risk than their counterparts because there is a significant positive correlation between bank executive directors and bank credit risk. Hypothesis H_{10} is, therefore, rejected. This finding, undoubtedly, challenges the stewardship theory (Pieper et al., 2008; Donaldson and Davis 1994).

Robustness Check

To ascertain the robustness of our findings, our model is re-estimated eliminating the insignificant variables in the initial results. The results of the robustness check are presented in Table 5. As can be observed, all the variables except leverage (LEV) have maintained their significant impact on credit risk. Thus, confirming the robustness of our initial findings.

Table 5: Robustness Check Results-Dependent Variable=Credit Risk

Variable	Coefficient	Std Error	t-Statistic	P-value
LEV	-34.1324	25.3436	-1.3468	0.1865
*Ln*LLP	0.7024	0.3590	1.9566	0.0582*
*Ln*ASSETS	2.0585	1.2850	1.6019	0.1179
LnBSIZE	-68.155	34.0895	-2.0019	0.0529**
*Ln*BCOM	8.0000	3.9620	2.0192	0.0510*
*Ln*INSID)	16.8775	9.4613	1.7839	0.0829*
C	75.852	53.6971	1.4126	0.1664
R^2	0.54	Durbin-Watson Stat=2.5	N=58	
F-statistic	2.051		Prob(F-statistic)	0.000031

*This table shows the results of our robustness check on our initial results. ***, **, * represent 1%, 5% and 10% significance levels*

CONCLUSION, POLICY IMPLICATION AND LIMITATIONS OF THE PAPER

The study investigates the predictors of credit risk in the universal banking industry in Ghana. Purposively sampled panel data (2006-2010) from 14 out of the 26 universal banks in Ghana have been used for analysis. We have employed panel data regression techniques to estimate our chosen model. The study finds that leverage, assets (size), loan loss provision, board size, board independence, and the number of executive directors on the board of a universal bank are the predictors of its credit risk. The study, therefore, submits that universal banks in Ghana could improve their credit risk management by formulating policies around these factors. Obviously, these results demonstrate the relevance of board structure to credit risk management of universal banks in Ghana. One major policy implication in terms of governance of universal banks in Ghana is that having a large board size consisting of people with relevant experience and expertise is likely to augur well for credit risk management. We, therefore, recommend that, subject to their scope of operations, universal banks in Ghana should consider increasing the size of their boards with competent directors if they would like to reduce their credit risk. One limitation of this paper is that it has relied on financial reports of the selected universal banks. Thus, the validity of the findings and conclusions is limited to the extent to which these data are reliable. Another limitation is that the study period (2006-2010) is a bit short due to lack of data. We, therefore, recommend that future researchers should explore the possibility of investigating the determinants of credit risk in the universal banking industry over a longer period for more reliable results. Notwithstanding the above-mentioned limitations, the paper makes a significant contribution to the extant literature on credit risk by establishing the relevance of board structure to the credit risk management discourse.

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