Bearing of Credit Risk Management on Financial Performance: Evidence from Financial Institutions in Ghana

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ABSTRACT

Effective management of working capital is an essential indicator of a good financial health of an organization. This means managing working capital is important for the smooth running of a firm. Giving the significance of working capital, this paper examines the effect of working capital management on listed manufacturing firms in Ghana based on quantitative analysis of stock market data. A five-year data was sourced from the financial statements of twelve (12) manufacturing companies listed on the Ghana Stock Exchange (GSE). The profitability ratios; Return on Asset (ROA) and Return on Equity (ROE) were computed, as well as the components of working capital, which were used to calculate Cash Conversion Cycle. The Cash Conversion Cycle (CCC) was used to measure working capital, whereas the profitability ratios were used to determine the companies' profitability. We observed that whereas 9 firms have statistically significant relation between CCC and profitability, the rest of the firms had an insignificant relationship.

Keywords: Credit, Risk Management, financial performance, financial institutions

INTRODUCTION

Banks are important financial institutions whose investments and expertise play an active part in the development of the national economy in many parts of the world (Witte & Deuchert, 2012). Banks are key players in the financial system, and they help mitigate the significant informational costs of assessing and monitoring the creditworthiness of borrowers. Modern societies rely on the financial system to help spread capital efficiently throughout the economy (Hartlage, 2012). Banking is a practice that has direct contact with public activities. As an important sector in the economic role of a country, banking has a unique function of business, as well as stabilizing the State financial atmosphere (Sjahril et al., 2015). The banking industry, noticeably, has a huge effect on capital markets, especially on economic wellbeing (Lilius, 2012). A modern banking system performs several crucial roles in spreading capital, including transferring resources across time and space, managing risk, clearing and settling payments, pooling resources, and providing information (Hartlage, 2012). In banking, entity assets are created through a process of intermediation by accepting deposits; the basic function of intermediation itself is a source of credit and liquidity risks for any banking institution (Jayadev, 2013). Banks are exposed to various market and non-market risks in performing their functions. These risks expose banks to events, both expected and unexpected, with the potential to cause losses, putting depositors’ money at risk (Jayadev, 2013). Commercial banks have also been the major victims of recent financial crisis, debt crisis and continuing market turmoil that have been witnessed
in the past, which led to collapse of several banks (Lilius, 2012). The banking financial crises have always been seen as painful constituents of the economic system and most of the bank failures have been blamed on lack of proper financial regulation (Nowak, 2011).

The importance of the role of banks in both maintaining economic growth and enormously contributing in economic collapses, prompted the Basel Committee to focus on adequately regulating the banking sector and forcing banks of the member countries to apply its capital standards (Kcharem, 2014). Currently, financial institutions are required to meet more stringent capital requirements than they were before the recent financial crisis; in particular, the capital requirement for a large bank is trading book under the Basel Accord (Zaiwen et al., 2013). Effective banking supervision and sufficient bank capitalization are stipulated as the two cornerstones for a stable financial system and will reduce the likelihood of financial distress (Witte & Deuchert, 2012).

Thus, regulation acts as an external force in the capital optimization process as banks set simultaneously the level of capital and the amount of risky assets to hold in order to comply with the minimum capital ratio. The soundness of the banking system is a key element in the implementation of the prudential framework, especially with reference to capital regulation, that aims to control bank risk taking (Tanda, 2010).

The supervisory and regulatory bodies of the banking industry in Ghana carried out significant reforms in the banking regulatory system to safeguard the industry (Smith, 2004). The most important ones are Basel Accords; Basel I and II, which refer to the banking supervision accords issued by Basel Committee on Banking Supervision (BCBS). Basel I, also known as 1988 Basel Accord, implemented a framework for a minimum capital standard of 8% for banks. Basel I, with a focus on credit risk, considers the minimum capital requirement as the main tool to prevent banks from taking excessive risk. The main reason was the belief that a well-designed structure of incentives is more effective than structural controls. Basel I contributed to the financial stability by creating conditions for equal competitions amongst banks across borders.

However, several issues such as lack of risk sensitive measures of the creditworthiness and weak incentives for banks to strengthen risk management system, emerged as shortcomings (Iqbal and Mirakhor, 2007).

These stimulated significant opportunities for regulatory arbitrage such as the increase of off balance-sheet exposure. It was revealed that Basel I was unable to provide an adequate response to the changing global context. Consequently, Basel II came into effect to better reflect banks’ underlying risk and response to financial innovation like securitization. It was argued that Basel II improved risk management practices that were not evident in Basel I”.

Several years after its implementation in the Ghanaian banking sector, evidence regarding its impact on risk management practices is almost nonexistent (Witte & Deuchert, 2013). Moreover, Basel II regulations is supposed to redefine global standards for bank capital, liquidity and leverage, and expected to profoundly impact how banks manage their balance sheets (King and Tarbert, 2011). Liquidity investors need to understand how banks will treat deposits under this rule. In this way, they can most effectively structure and segment their liquidity portfolios to gain the greatest benefit from this rules and incentives, and maximize their investment returns.

The researcher therefore finds it pertinent to investigate the effect of credit risk management on profitability of commercial banks from the perspective of Basel II. Since the core activity of banks is credit financing, it is important to note that if the credit risk management is sound, the profit level will be satisfactory. On the contrary, if the credit risk management is poor, the profit level will be relatively lower. Because the less the banks loss from credits, the more the banks gain”. The central question is how significant is the impact of credit risk management on profitability.

The study seeks to assess the relationship between credit risk management and profitability of commercial banks in Ghana.

LITERATURE REVIEW

Credit Risk Management

All human actions entail some risks. Some are risk seekers or accepters by temperament, while others are risk avoiders. There is even evidence that removal of some risks will cause persons purposely to subject themselves to a new one, suggesting that they seek some kind of undefined risk balance in their lives. Risk is an elusive element in most decisions, largely because it is so hard to pin down. Also, there will always be risks associated with mitigation strategy developments and maintenance (Jappelli, 2006). Risk Management (RM) includes several related actions involving risk: planning, assessment
(identification and analysis), handling, and monitoring. Risk planning is a process of developing and documenting the strategy and methods for identifying and tracking risk issues, developing risk handling plans, performing continuous risk analysis to know how risks have changed, and assigning adequate resources. A risk management plan includes information on stakeholders, planning processes, project tools, and metrics, and it states the standards and objectives for RM on a project (Duffie and Lando, 2000). Risk handling is the process that identifies, evaluates, selects, and implements options in order to set risk at acceptable levels, given program constraints and objectives. This includes the specifics on what should be done, when it should be accomplished, who is responsible, and associated cost and schedule. Risk handling options include assumption, avoidance, control (also known as mitigation), and transfer. The most desirable handling option is selected, and a specific approach is then developed for this option (Roszbach and Jacobson, 1998).

Risk monitoring is the process that systematically tracks and evaluates the performance of risk handling actions throughout the acquisition process and provides inputs to updating risk handling strategies, as appropriate. RM is never just about looking forward. Heeding the lessons learned on projects of all types, even some very distant examples can help avoid problems on new projects (Duffie and Lando, 2000). The risks contained in the bank's principal activities, that is, those involving its own balance sheet and its basic business of lending and borrowing, are not all borne by the bank itself. In many instances, the institution will eliminate or mitigate the risks associated with a transaction by proper business practices, while in others; it will shift the risk to other parties through a combination of pricing and product design. The banking industry recognizes that any institution does not need to engage in business in a manner that unnecessarily imposes risk upon it; nor should it absorb risk that can be efficiently transferred to other participants. Rather, it should only manage risks at the firm level that are more efficiently managed there than by the market itself or by their owners in their own portfolios. It should accept only those risks that are uniquely a part of the bank's array of services.

According to Oldfield and Santomero (2007), risks facing all financial banks can be segmented into three separable types, from a management perspective. These are: risks that can be eliminated or avoided by simple business practices, risks that can be transferred to other participants, and risks that must be actively managed at the firm level. In the first instance of these cases, the practice of risk avoidance involves actions to reduce the chances of idiosyncratic losses from standard banking activity by eliminating risks that are superfluous to the institution's business purpose. Common risk avoidance practices here include at least three types of actions. The standardization of processes, contracts and procedures to prevent inefficient or incorrect financial decisions is the first of these. The construction of portfolios that benefit from diversification across borrowers and that reduce the effects of anyone’s loss experience is another. Finally, the implementation of incentive-compatible contracts with the institution's management to require that employees be held accountable is the third. In each case the goal is to rid the firm of risks that are not essential to the financial service provided or to absorb only an optimal quantity of a particular kind of risk (Oldfield and Santomero, 2007). There are also some risks that can be eliminated, or at least substantially reduced through the technique of risk transfer. Markets exist for many of the risks borne by the banking firm. Interest rate risk can be transferred by interest rate products such as swaps or other derivatives. Borrowing terms can be altered to affect a change in their duration. Finally, the bank can buy or sell financial claims to diversify or concentrate the risks that result from servicing its client base. To the extent that the financial risks of the assets created by the firm are understood by the market, these assets can be sold at their fair value (Roszbach and Jacobson, 1998).

**Basel Accord: Banks' Choice of Loan Rating**

In June 1999, the Basel Committee issued a first consultative paper "A New Capital Adequacy Framework" to replace the 1944 Accord. With regard to the minimum regulatory capital requirements, the consultative paper proposes a two-layer regime for the capital treatment of credit risk, with a revised standardized approach, where risk-weights would be based on external ratings, and a brand-new internal ratings-based (IRB) approach, where risk-weights would be based on banks' own assessments of credit risk. Other important modifications of the minimum capital requirements are a revised treatment of credit risk mitigation techniques and asset securitization, and the introduction of explicit capital charges for operational risk. The document also suggests complementing the minimum capital requirements with two additional pillars which include a
supervisory review process and an effective use of market discipline (Repullo, 2002). In January 2001 and in April 2003, the Committee issued two additional consultative papers "The New Basel Accord, Consultative paper" and "The New Basel Accord" addressing a number of issues left open in the first document, especially regarding the structure and the calibration of the IRB approach. The Committee outlined several objectives in revising the Basel Accord: improving the risk sensitivity of the capital requirements, reducing the scope for regulatory arbitrage, and providing more flexibility in the calculation of the capital requirements. The Basel Committee recognized that the "broad brush" nature of the current Accord (where required capital generally does not differ by the degree of risk) encourages regulatory arbitrage (Repullo, 2002).

The two-layer capital framework proposed for credit risk implies that in the segment of corporate borrowers, banks eligible for the standardized approach will face very different capital requirements than those eligible for the IRB approach. For banks using the standardized approach, the capital requirements for claims on corporate borrowers will still look like a risk insensitive leverage ratio and only a minor fraction of corporate borrowers' dispose of an external rating and the new risk-weighting framework for that kind of borrower deviates from the traditional 100% risk-weight only for very high or low ratings. By contrast, banks eligible for the IRB approach will face risk-sensitive capital requirements. That is, the internal rating coverage is large for all types of corporate borrowers and the risk-weighting scheme for that regime was fine-tuned. The transition to a two-layer capital framework for credit risk is important, as this type of risk constitutes the core of regulatory capital requirements (Kim and Santomero, 1944).

The co-existence of the IRB approach with the standardized approach can raise concerns regarding the risk behaviour of the banks that will still have to comply with the second – much less risk-sensitive - regime. In most countries, large sophisticated banks (the more likely to be eligible for the IRB approach) still compete with smaller and less sophisticated banks (the more likely to be eligible for the standardized approach) in important segments of the domestic loan market. With the two-layer capital requirement framework, this means that sophisticated and unsophisticated banks will have to comply with a different capital requirement when competing for the same borrower. When capital requirements are binding, this can affect the competitiveness of sophisticated banks and unsophisticated banks in the various risk segments and distort the portfolio allocation by the two categories of banks (Decamps, Roger and Rochet, 2002). The Basel Committee's proposals have stimulated an intense academic research. A large number of papers have been dedicated to credit risk modelling, with a particular focus on the consistency between the IRB risk-weighting framework and the empirical evidence on credit risk. Frey and McNeil (2002) address the non-coherence of VaR as a risk measure in the context of portfolio credit risk. They show that VaR is not sub-additive, which questions its use for the definition of capital requirements, as proposed under the new Basel Accord.

Jackson, Perraudin and Saporta (2002) compared the solvency standard implied by the new Accord to the solvency standard banks chosen by their own capital setting decision. They conclude that for large international banks, the minimum regulatory capital requirement would not be binding. A smaller number of papers look at the new Basel Accord from an incentive perspective. Decamps, Roger and Rochet (2002) examined the optimal mix between the three pillars. They showed that market discipline can reduce the minimum capital requirement needed to prevent moral hazard. Altman and Saunders (2001) compared the capital charges under the Standardized approach to those obtained under the foundation Internal Ratings-Based (IRB). They argued that for banks with an average quality portfolio, there is no incentive to shift from the standardized to the foundation IRB approach.

**Impact of Basel II accord on the Banking Industry**

Basel II has significant economic and structural consequences that cannot be underestimated. It is expected that the implementation of Basel II will lead to a substantial redistribution of capital requirements and banks will need to take the several issues into consideration. Basel II is costly to implement, complex to understand and prescriptive in its numerous recommendations (Financial Times, 2004). Basel II favours active risk management and in preparation for its adoption, banks are improving their internal models. The costs of compliance with the IRB approach are significant, ranging from investments in data collection and IT systems to training and recruiting staff. For example, the Credit Suisse estimates the initial cost to be around $100m just to implement the system, plus substantial ongoing costs (Bischofberger and Rybach, 2003).
A survey of industry preparations for Basel II, suggests that the Basel II programme will cost anywhere between £6m to £125m and indicates the importance of the involvement of senior management in its implementation. The incentive for banks to make these investments in risk management and new technologies is that banks will try to use models to reduce the overall amount of regulatory capital and increase their return on equity (Rodriguez, 2002). According to one calculation, ‘for a large bank with risk weighted assets of Euro 500 billion, cutting the amount of capital by just 0.5 per cent would save Euro 2.5 billion’. Banks are ready to make investments in Basel II in the hope that their overall amount of regulatory capital will be reduced, and hence resources can be freed up to apply against new business. The overall reduction in the amount of capital is, however, contrary to the stated objective of the Basel process: the stability of the banking system. Commercial lending is affected by Basel II (Bischofberger and Rybach, 2003). Basel I provides only one risk weight category for ordinary corporate lending: 100 per cent; whereas Basel II will provide four categories: 20 per cent, 50 per cent, 100 per cent and 150 per cent, with these risk weights refined by reference to a rating provided by an external rating agency. High quality loans will attract a higher external rating and a lower capital charge, which will result in more attractive pricing of such loans. Retail lending benefited from the Basel II rules; in particular mortgage lending reduced from 50 per cent to 35 per cent risk weightings. Credit card business and other consumer loans will also enjoy a drop, in weightings from 100 per cent to 75 per cent. This reduction in risk weightings can become an incentive for banks to push more capital into retail activities (Ferguson, 2003).

EMPIRICAL LITERATURE
Credit risk represents a measurable threat to the banks’ profitability; as a result, several researchers have examined the impact of credit risk management (CRM) on bank performance in different scopes. Ahmed, Takeda, and Shawn (1998) employed multivariate regression and found that loan loss provision has an important positive impact on non-performing loans. So, a raise in loan loss provision implies an elevation in credit risk and decomposition in the value of loans subsequently distressing bank performance negatively”.

In another study, Ahmad and Ariff (2007) used regression analysis in their study to establish the most important determinant of credit risk of commercial banks in emerging economies’ banking systems weighted against the developed economies’ banking systems. It establishes that a rise in loan loss provision is as well regarded as a major determinant of potential credit risk. They added that credit risk in emerging economies’ banks is greater than that in developed economies. In an effort to study the impact of bank regulations, concentration, financial and institutional development on commercial banks’ margin, and profitability in the Middle East and North Africa (MENA) nations from 1989 to 2005, using the unbalanced panel data regression, Ben-Naceur and Omran (2008) found that bank capitalization and credit risk have considerable and positive influence on net interest margin, cost efficiency, and profitability of banks.

Similarly, in an attempt to find the impact of effective CRM on bank survival, Njanike (2009) appraised the degree to which failure to efficiently deal with credit risk leads to banks’ failure in Zimbabwe between 2003 and 2004. The study established that the failure to efficiently handle credit risk led to a higher-level banking crisis. It recommended that banks should establish and implement credit scoring and evaluation methodologies, review and revise the insider loans policies, and implement prudential corporate governance practices. In another study conducted in Kenya, Kithinji (2010) measured the effect of CRM on banks’ profitability through the use of regression model. The study uses records on the total credit, level of non-performing loans, and profits for the period of five years. It reveals that the accumulated profits of banks are not influenced by the quantity of credit and non-performing loans. Hence, Kithinji (2010) proposed that other variables other than credit and non-performing loans have greater effects on the profitability of banks.

Al-Khoury (2011) further evaluated the effect of bank’s specific risk characteristics and the overall banking environment on the performance of 43 commercial banks operating in six of the Gulf Cooperation Council (GCC) countries over the period of 10 years. The study adopts regression as an analysis tool, and its findings prove that credit risk, liquidity risk, and capital risk are the key aspects that influence bank profitability in the GCC countries. Kargi (2011) reviewed the impact of credit risk on the profitability of Nigerian banks, using five years’ data for the period of 2004-2008. The study examines the relationship through the use of descriptive, correlation, as well as regression model.”. He established that CRM has an important role in the profitability of Nigerian banking sector. The study
supports the claim that profitability of bank is negatively controlled by loans and advances, non-performing loans, and deposits levels, thus exposing banks to huge risk of illiquidity and distress. In Costa-Rica, Epureand Lafuente (2012) applied regression analysis to study the presence of credit risk on bank performance. They discovered that “performance improvements led to regulatory changes and that credit risk accounts for differences in bank performance, while non-performing loans inversely affect efficiency and return on assets (ROA) and the capital adequacy ratio (CAR) has a positive influence on the net interest margin”. In another recent study conducted in Nepal, Poudel (2012) assessed the effect of CRM on the financial performance of Nepalese banks using regression analysis. The study establishes that all credit risk factors have an inverse influence on the financial performance of banks; conversely, the default rate (DR) exerts a major impact on bank performance. The study proposes banks to create and develop policies with the aim of not only reducing the exposure of the banks to credit risk but also improving profitability”. In another study conducted in Taiwan, Chen and Pan (2012) assessed the credit risk efficiency of banks for the period of four years (2005-2008). The study employs financial ratio to measure the credit risk and evaluate profitability using Data Envemoment Analysis (DEA). The credit risk measures were credit risk technical efficiency, credit risk allocation efficiency, and credit risk cost efficiency. The findings suggest that only one bank is competent in all forms of efficiencies over the assessment periods. The Ghanaian study by Boahene et al. (2012) utilized regression analysis in an attempt to reveal the connection between credit risk and profitability of selected banks and established that credit risk components (non-performing loan rate, net charge-off rate, and the pre-provision profit as a percentage of net total loans and advances) have a positive and significant relationship with bank profitability. This shows that banks in Ghana enjoy high profitability regardless of high credit risk, an opposing view to other views expressed in many studies that credit risk indicators are negatively related to profitability. In contrast to the position of the Ghanaian study, scholars like Kolapo, Ayeni, and Oke (2012) studied CRM and performance of Nigerian banks using panel model regression analysis. They argued that the impact of credit risk on bank performance considered using the ROA of banks as a measure of performance in Nigeria is cross-sectional invariant”. A rise in non-performing loans or loan losses provision reduces profitability (ROA), whereas a rise in total loan and advances improves profitability. The study suggests that “Nigeria banks have to improve their ability in credit analysis and loan management, whereas the regulatory authorities ought to give extra concentration to banks’ conformity to applicable requirements of the Bank and Other Financial Institutions Act (BOFIA) and prudential guidelines governing banking practices in Nigeria”. Gottschalk and Griffith-Jones (2006) examined the implementation of Basel II in low-income countries (LIC). The study assessed the low-income countries’ views and concerns on Basel II, whether and how they intend to implement the new Basel Capital Accord, and the challenges they may face in doing so. In addition, the study discussed the possible implications of Basel II implementation for competitiveness of LIC banking sectors and financial inclusion. The study findings established that most LICs are adopting a very cautious approach towards Basel II. The study intentions were first to understand better how Basel II works and to have a better grasp of their possible implications, in order to be able to adopt an informed decision on the issue. Furthermore, the study found out that several LIC countries felt that they have previous tasks to complete within Basle I or more generally within banking regulations before they tackle Basle II and III. Slovak and Courne (2011) estimated the medium-term impact on economic output of the announced Basel III capital requirements using a consistent approach across the three main OECD economies. The analysis used an average impact on annual GDP growth in the range of −0.05 to −0.15 percentage point during a five-year period. In addition, the study established that economic output is mainly affected by an increase in bank lending spreads as banks pass a rise in bank funding costs, due to higher capital requirements, to their customers. To meet the capital requirements effective in 2015 (4.5% for the common equity ratio, 6% for the Tier 1 capital ratio), banks are estimated to increase their lending spreads on average by about 15 basis points. The capital requirements effective as of 2019 (7% for the common equity ratio, 8.5% for the Tier 1 capital ratio) could increase bank lending spreads by about 50 basis points. Paolo (2011) assessed the long-term economic impact of the new regulatory standards (the Basel II reform). The study aimed at determining the impact of the reform on long-term economic performance, economic fluctuations and the adoption of countercyclical capital buffers on economic
fluctuations. The study findings established that each percentage point increase in the capital ratio causes a median 0.09 percent decline in the level of steady state output, relative to the baseline. In addition, the study revealed that the impact of the new liquidity regulation is of a similar order of magnitude, at 0.08 percent. Kcharem (2014) studied the impact of Basel II capital requirements on the financial sector and the real economy. The study tried to identify the reasons of regulating banks and introduced the two previous Basel Accords. The study concluded that Basel II capital requirements are still not enough robust to keep abreast of continuous banking and financial developments. In addition, the study concluded that the implementation of the new regulatory framework will have both negative and positive repercussions for market participants. Tan (2015) examined financial distress and firm performance evidence from the Asian financial crisis. Using a sample of 277 firms from eight East Asian economies, the relationship between financial distress and firm performance during the Asian Financial Crisis of 1997-1998 was tested. This was because the crisis provided an exogenous shock, which reduced the endogeneity issues between firm performance and leverage. The results from the study established that firms with low financial leverage tend to perform better than firms with high financial leverage. Additionally, the study established that the Asian Financial Crisis of 1997-1998 magnified the negative relationship between financial distress and firm performance. High-leverage firms were found to experience worse performance during a crisis. Choy, S. L. W., Munusamy, J., Chelliah, S. & Mandari, A. (2011) assessed the performance of Malaysian companies after suffering from a financial distress condition. The study used qualitative study where data was collected from Bursa Saham Malaysia. The performance of companies emerging from a distress condition was assessed by the improvement of stock prices and other financial ratios that indicated the company is performing better compared to pre-bankruptcy period. The study findings established that company performance (ROE, EBIT/TA, and EPS), successful company reorganization, and management change affect stock prices positively. Additionally, the study revealed that the performance of second distress condition companies affect stock price performance negatively. Ghati (2009) assessed the preparedness of Kenyan Commercial Banks towards Basel II implementation. Primary data was collected through questionnaires based upon a review of the theoretical and empirical literature on Basel II. The study findings established that none of the banks in Kenya had implemented Basel II in its entirety. In addition, the study established that most institutions would be ready to implement the new accord in the year 2010, as evidenced by the level of awareness and the low number of institutions with ready set budgets for Basel implementation. Further, the study established that for successful implementation of Basel II, institutions would have to acquire system infrastructures and upgrade their technology and data systems to facilitate and ensure that models are comprehensively developed and validated, and that the system infrastructures are compatible with the new models with capabilities of effectively managing the requisite data. Additionally, the study found that the critical challenges faced by most institutions are among others; model development, model validation, technology and system infrastructure, expertise and human resources competences, and implementation costs. All the resources namely skills, technology, expertise, money, time and data were considered influential in Basel implementation. Ndimu (2011) examined the extent of Basel II adoption and its perceived implications on commercial banks in Kenya. A descriptive survey was undertaken and the population was all the commercial banks registered and licensed to undertake commercial banking business in Kenya. Amponsah (2013) examined the impact of financial distress on commercial banks’ performance in Ghana. From a population of forty-four banks, a sample of twenty-two banks was selected. The sample included eleven listed banks at the GSE and eleven non-listed banks. Data was obtained from the financial statements of the banks and the Central bank of Ghana. Altman’s Z score model was used to measure financial distress while return on assets ratio was used to measure financial performance. The study found out that most of the banks under study suffered financial distress where the non-listed banks suffered more from financial distress as compared to the listed banks. The study also established that financial distress had a significant effect on financial performance of banks where performance was negatively affected.

Aboagye and Otieku, (2010) conducted a study on Credit Risk Management and Profitability in financial institutions in Sweden. The main objective was to find out if the management of the risk related to that credit affects the profitability of the financial institutions. They found that credit risk management in financial institutions has become more important not only because of the financial crisis that the world is experiencing nowadays, but also the introduction
of Basel II. They concluded that since granting credit is one of the main sources of income in financial institutions, the management of the risk related to that credit affects the profitability of the financial institutions.

**METHODOOGY**

For the purpose of this study, four (4) commercial banks were used as the case study. The data source of the study were acquired from the financial statements of the banks. From the financial statements, data was analysed from the variables; Return on Equity (ROE) as the dependent variable, Non-Performing Loans Ratio (NPLR) and Capital Adequacy Ratio (CAR) as the independent variables inculcated from the periods 2006-2014.

**Model Specification**

In order to establish the relationship between Credit Risk Management components and Commercial Banks Profitability over eight (8) years period, the panel data regression analysis was used. Multivariate regression model was used to predict the relationship between Credit Risk Management and Commercial Banks Profitability. The function of the model is given as:

\[ Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_n X_n + \varepsilon \]

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<th>“Standard”</th>
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<td>Y = the value of dependent variable;</td>
<td>Y: ROE- Profitability indicator</td>
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<td>( \alpha ) = the constant term;</td>
<td>X1: NPLR – credit risk management indicator</td>
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<td>( \beta ) = the coefficient of the function;</td>
<td>X2: CAR – credit risk management indicator</td>
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<td>( X ) = the value of independent variables;</td>
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The general model of the study is:

\[ \text{ROE} = \alpha + \beta_1 \text{NPLR} + \beta_2 \text{CAR} + \varepsilon \]

It is the regression function which determines the relation of X (NPLR and CAR) to Y (ROE). \( \alpha \) is the constant term and \( \beta \) is the coefficient of the function, which is the value for the regression equation to predict the variances in dependent variable from the independent variables. This means that if \( \beta \) coefficient is negative, the predictor or independent variable affects dependent variable negatively: one unit increase in independent variable will decrease the dependent variable by the coefficient amount. In the same way, if the \( \beta \) coefficient is positive, the dependent variable increases by the coefficient amount.

\( \alpha \) is the constant value which dependent variable predicted to have when independent variables equal to zero (if \( X_1, X_2=0 \) then \( \alpha = Y \)). Finally, \( \varepsilon \) is the disturbance or error term, which expresses the effect of all other variables except for the independent variables on the dependent variable that we use in the function. The regression analysis output contains values which are discussed below:

\( R^2 \) is the proportion of variance in the dependent variable that can be predicted from independent variables. There is also adjusted \( R^2 \) which gives more accurate value by avoiding overestimation effect of adding more variables to the function. So, high \( R^2 \) value indicates that prediction power of dependent variable by independent variables is also high. Adjusted \( R^2 \) is calculated using the formula 1-((1-\( R^2 \))*((N-1)/(N-k+1))18”.

The formula shows that if the number of observations is small, the difference between \( R^2 \) and adjusted \( R^2 \) is greater than 1 since the denominator is much smaller than numerator. Adjusted \( R^2 \) sometimes gives negative value. Since \( R^2 \) is adjusted to find out how much fit probably happen just by luck: the difference is amount of fit by chance. Also, negative values of adjusted \( R^2 \) occur if the model contains conditions that do not help to predict the response (ROE) or the predictors (NPLR and CAR) chosen are wrong to predict ROE. \( R^2 \) is generally considered to be secondary importance, unless the primary concern is of using regression equation to make accurate predictions. \( R^2 \) is an overall measurement of the strength of association, and does not reflect how any independent variable is associated with the dependent variable.

The Probability value (P-value) is used to measure how reliably the independent variables can predict the dependent variable. It is compared to the significance level which is typically 0.05. If the P-value is greater than 0.05, it can be said that the independent variable does not show a statistically significant relationship with the dependent variable. The F-value calculated as \((R^2/n)/(1- R^2/n19-2)\) and associated P-value shall be looked at to measure the effect of the group of independent variables on dependent variable. The resulted F-value would be compared to the critical F-value (Fv1, v2) which is taken from the F distribution table. Both V1 and V2...
are called as degrees of freedom. V1 is number of independent variables and V2 is number of observations minus number of independent variable minus 1.

RESULTS AND DISCUSSIONS
The analysis was undertaken at 5% significance level. The criteria for comparing whether the predictor variables were significant in the model was through comparing the corresponding probability value obtained and equal to 0.05. If the probability value is less than 0.05, then the predictor variable is significant otherwise it is not. In the model, β is the coefficient of the function; it is the value for the regression equation to predict the variances in dependent variable from the independent variables. This means that if β coefficient is negative, the predictor or independent variable affects dependent variable negatively: one unit increase in independent variable will decrease the dependent variable by the coefficient amount. In the same way, if the β coefficient is positive, the dependent variable increases by the coefficient amount. $R^2$ is the overall measurement of the strength of association. High $R^2$ value indicates that prediction power of dependent variable by independent variables is also high. Adjusted $R^2$ gives more accurate value by avoiding overestimation effect of adding more variables to the function.

F-test was used to verify the significance of the overall model at a 5 percent significant level. If the statistic value exceeds the critical value in the model, it means the regression is significant and that the independent variables (NPLR and CAR) can reliably predict the profitability (ROE) of the bank.

**Fig 1.** Coefficient summary table, of the 4 banks

<table>
<thead>
<tr>
<th>*ROE</th>
<th>Coef.</th>
<th>(P-value)</th>
<th>N.</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPLR</td>
<td>-4.965</td>
<td>0.004</td>
<td>36</td>
</tr>
<tr>
<td>CAR</td>
<td>0.21</td>
<td>0.54</td>
<td>36</td>
</tr>
</tbody>
</table>

* ROE is independent variable; **Statistically Significant at 0.05=5%”

**Fig 2.** Model summary table of the 4 banks

<table>
<thead>
<tr>
<th>$R^2$</th>
<th>Adj. $R^2$</th>
<th>F</th>
<th>(P-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.251</td>
<td>0.206</td>
<td>5.532</td>
<td>0.008</td>
</tr>
</tbody>
</table>

Figure 1 and 2 above present regression results for the profitability equation, discussed in the methodology part, where ROE is dependent variable. Figure 1 shows that NPLR affects ROE negatively. NPLR β coefficient is -4.965 which means that one unit increase in NPLR decreases ROE by 4.965 units while CAR is held constant. The statistical significance of NPLR on ROE is 0.004 which is less than 0.05. This means that NPLR predicts effect on ROE with 99.6% probability. CAR on the contrary has a positive β coefficient 0.21. This indicates that one unit increases in CAR will increase ROE by 0.21 units, holding NPLR constant”. “The statistical significance of CAR is 0.541 which is a sign of relatively low significance. It implies that CAR predicts ROE with 45.9% probability. Thus, the results of the analysis states that NPLR has negative and significant effect on ROE, meanwhile CAR has positive and insignificant effect on ROE in comparison to NPLR”.

Furthermore, Figure 2 presents the figures for the whole equation. $R^2$ represents the prediction level of variance in ROE by NPLR and CAR, which is 0.251. This means that 25.1% of ROE can be predicted from both NPLR and CAR. Between two independent variables, NPLR more reliably predicts ROE. This fact can be confirmed by the result of simple regression analysis conducted separately with each independent variable. The results show that NPLR has 24.2% predicting the ability of ROE while CAR has only 2.9%”. Adjusted $R^2$ (20.6%) avoids the overestimation effect of adding CAR as second independent variable to the model. Therefore, adjusted $R^2$ is treated as more accurate values even though $R^2$ is differing by 4.4% (25.1%-20.6%=4.5%)”.

According to the table of F-distribution, the critical value of F distribution at the 5% significant level is 3.32. In Table 2, the statistic value of F is 5.532, which exceeds the critical value of F (3.32). Hence, the regression as a whole is significant; this mean that NPLR and CAR reliably predict ROE. Furthermore, the P-value (significance) is 0.008, which also indicates that ROE is predicted with 99.92% probability by NPLR and CAR together and shows a statistically significant relationship among them. Therefore, the F-value proves that there is a significant relationship between the profitability measured as ROE and credit risk management measured as NPLR and CAR”.

http://onlinejournal.org.uk/index.php/ajmur/index
To conclude the analysis of the relationship between profitability and credit risk management in the four commercial banks in Ghana, CAR contributed positively to banks profitability, while NPLR showed negative effects. However, comparing these two factors, NPLR has more significant effect and CAR has small and insignificant on ROE. Exclusively, the results of the regression analysis show that credit risk management impact profitability on fairly significant level in the four commercial banks.

CONCLUSION AND RECOMMENDATIONS

The results obtained from the regression model show that there is an effect of credit risk management on profitability on reasonable level with 25.1% possibility of NPLR and CAR in predicting the variance in ROE. So, the credit risk management strategy defines profitability level to an important extent. Especially, NPL amount appears to be adding the most weight to that than CAR. However, separate analysis of each bank, considering the fact that the sample sizes are not on statistically satisfactory level, show that not all banks’ NPLR and CAR define ROE. As per the study findings, the study recommends that there is need for commercial banks in Ghana to fully implement Basel II as the study revealed that Basel II accord had a positive effect on the capital adequacy of commercial banks in Ghana that had implemented the Basel II recommendations. There is therefore need for the Central Bank of Ghana to ensure that commercial banks in Ghana fully implement the Basel II Accord.

In order for commercial banks to fully get the benefits of expected rate of return, there is need for the banks to ensure they fully implement Basel II requirement in relation to liquidity, CAR compliance, managerial quality, and cost of income and capital adequacy of commercial banks in Ghana. Additionally, Basel II provides opportunity for significant improvement in the risk sensitivity of capital regulation, and therefore can enhance internal controls in terms of capital regulation and migration towards more advanced risk management approaches in bank supervision. It is therefore recommended that policy makers continue to encourage its implementations because even though the framework is mandatory only for internationally active banks, the study shows that it actually reduces risks in the management of capital adequacy of commercial banks in Ghana.

Reference


