

UNIVERSITY OF GHANA

RISK MANAGEMENT AND SHAREHOLDERS' VALUE IN GHANAIAN BANKS

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**A THESIS SUBMITTED TO THE DEPARTMENT OF FINANCE, UNIVERSITY OF GHANA
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Declaration

I do hereby declare that this thesis is the result of my own research and has not been presented by anyone for any academic award in this or any other university. All references used in the work have been duly acknowledged.

I bear sole responsibility for any shortcomings.



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Certification

I hereby certify that this thesis was supervised in accordance with the procedures laid down by the University of Ghana.

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Dedication

This thesis is dedicated to my mum, **Dorothy Awo Ayernor** and my granddad **Prof. G. S. Ayernor**.



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Abstract

The aim of this study is to investigate the impact of risk factors on shareholder value (proxied by shareholder value ratio, which is computed as EVA divided by capital invested) in Ghanaian banks. To account for the persistence of shareholder value, we used the *System Generalised Method of Moments* technique for a panel of 25 Ghanaian banks that covers the period 2007-2013.

Results indicate that the three risk factors that must be on the top of the priority list of banks in Ghana in their bid to maximize *shareholders' value* are *credit risk*, *capital risk* and *liquidity risk*. Credit risk has a positive relationship with shareholder value. This result can be attributed to the fact that loan loss provisions are used to smooth profits. Similar to the findings in literature, capital risk and liquidity risk have a negative impact on shareholder value. Results also depict persistence of shareholder value that is, previous performance in terms of value created for shareholders positively influence subsequent value created. These results are robust to alternative performance measures and model specifications.

We also find that efforts directed towards maximizing shareholder value ratio would consequently improve the traditional measures such as ROE, ROA and EPR since they are highly correlated hence shareholder value ratio is a better measure of performance. Though ROE and ROA seem to show positive growth in bank performance over the period, shareholder value ratio shows a steady decline in performance. The decline is more pronounced when the financial turmoil was subsiding which debunks the assertion that the financial crisis had minimal effect on the Ghanaian banking industry. Interesting we find that whether a bank listed or not does not influence shareholder value ratio.

Abbreviations

BCBS	Basel Committee on Banking Supervision
BOG	Bank of Ghana
BSD	Bank Supervisory Department
CEBS	Committee of European Banking Supervision
ECB	European Central Bank
EPR	Economic Profit Added
EPS	Earnings per Share
EVA	Economic Value Added
GAB	Ghana Association of Bankers
GDPP	Gross Domestic Product per Capita
GSE	Ghana Stock Exchange
MVA	Market Value Added
PwC	PricewaterhouseCoopers
ROA	Return on Asset
ROE	Return on Equity
ROS	Return on Sales
SVR	Shareholder Value Ratio
TPF	Total Factor Productivity
TSR	Total Shareholder Return

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CHAPTER 1

INTRODUCTION

1.1. Background

As financial intermediaries, banks are the centre of a country's financial system especially in countries where capital markets are underdeveloped (Zang *et al.*, 2013) and play an important role in the economic development of the country as a whole (Levine, 2005). Therefore the safeness and soundness of the financial system is crucial to economic health of a country. In Ghana, the importance of the banking industry cannot be underestimated since the banking sector dominates the financial system with an increase in its total asset share of GDP from 39.8% in 2002 to 62.85% in 2010 of the financial sector's contribution to GDP (Amediku, 2013).

In performing their activities, banks are exposed to a variety of risks including credit risk, market risk, liquidity risk and operational risk. These risk factors affect the efficiency of banks in the provision of banking services, banks' operations and particularly banks' performance. It is therefore imperative that there are systems in place to handle their risk exposures since bank crisis always arise from an inappropriate identification, measurement, pricing or control of risk (Resti & Sironi, 2007). Although banks have always been leaders in the implementation of the most extensive and efficient risk management models, numerous weaknesses of risk management were exposed during the 2007-2009 financial crisis. A global survey conducted by KPMG (2009) depicts that lack of discipline in risk management was a contributory factor to the recent financial crisis. The failure of banks during the crisis has also been attributed to inefficient regulation. This has drawn huge attention to risks management and the minimum capital required to cushion banks

in times of distress. Consequently regulatory changes have become the main driver and influence on risk management practices. KPMG's (2009) global survey indicates that about 92% of banks had carried out or were about to change the way they manage risk. The Basel Committee on Banking Supervision also introduced the Basel III Accord to make provisions for new standards of risk management.

Even though the financial crisis had minimal effect on the performance of banks in Ghana, it has given stakeholders, the cause not only to consider the profits made in the sector, but also critically examine structures used to manage risks in the sector and protect their interests (Tsorhe *et al.*, 2011). This is evidenced in the fact that 64% of Directors of Ghanaian banks affirmed that risk management was their highest priority (PwC & GAB, 2010). Amisah-Arthur (2010) also stated that the safeness of the Ghanaian banking system hinges partly on a robust risk management system. In the recognition of these, the Bank of Ghana introduced risk-based supervision in its oversight of banks.

The financial turmoil has further illustrated that bank performance has the ability to influence efficient capital allocation, company growth, and economic growth in general (Fiordelisi & Molyneux, 2010a). A sound and profitable banking sector is better able to withstand negative shocks and contribute to the stability of the financial system. In the light of this, the determinants of bank performance have attracted the interest of academic research as well as of bank management, financial markets and bank supervisors (Anthanasoglou *et al.*, 2008). Moreover, with the globalization of competition, capital markets and a tidal wave of privatizations, shareholder value as a measure of performance, in particular is rapidly catching the attention of executives throughout the world (Kheyrkarkeshavars *et al.*, 2013). As a result, creating value for shareholders has been the main objective of banks over the last two decades (Rapp *et al.*, 2010). For banks, the

shareholder value approach is not only an important strategic management tool; its objective of maximizing shareholder value is vital for banks to exist (Gross, 2006). An increase in shareholder value not only increases the confidence of existing shareholders but also attracts new investors (Arif & Afzal, 2012). To increase shareholders value, the first key tool is an effective risk management system: the bank must be able to identify, measure, control and above all price all the risks taken aboard, more or less consciously, in and off its balance sheet (Resti & Sironi, 2007). In the light of these, there is the need to ascertain which risk factors impact shareholder value. According to Fatemi & Fooladi (2006), banks should only exercise risk management practices if they help to increase shareholder value. There is still no consensus on how to proxy performance however, one popular and comprehensive measure of shareholder value is the trade marked Economic Value Added (EVA) developed by Stern Stewart and Co. Stewart (1991) argues that EVA is the financial performance measure that comes closer than any other to capturing the true economic profit of an enterprise.

1.2. Problem Statement

Risks management has become a highly discussed topic in recent times due to the financial turmoil. Despite its importance in the banking industry, there seems to be a limited literature on the systems and mechanisms used by Ghanaian banks to monitor, control and mitigate their risk exposures. Though some banks around the world that have fully implemented the Basel II Accord suffered during the financial crisis, banks in Ghana have remained stable in terms of performance (BOG, 2012). Conducting a research to ascertain how Ghanaian banks manage risk would therefore shed light on the almost non-existing evidence on risk management practices in the Ghanaian banking industry. With 64% of Ghanaian bank directors declaring that risk management is their priority

after the financial crisis, this research seeks to shed light on the way banks have positioned themselves to better handle their risk exposures.

The shareholder value maximization approach to management is also recently gaining grounds in banks across the world. In order to create value, banks should aim at increasing net operating profit after tax and reducing cost. In Ghana, shareholder's value, which is usually represented by return on equity, edged up to 16.7% in 2010 following the reduction from 21.7% in 2008 to 12.1% in 2009. The economic challenges of 2012 did not have a significant adverse impact on the banking industry as it recorded an average of 23.8% return on equity (PwC, 2013). ROE and ROA remain the main measure of performance in Ghanaian banking industry. Despite its popularity and relevance around the world, shareholder value has not gained much attention in the Ghanaian banking industry. The focus has been on improving banking efficiency, profitability having a well-developed financial system in place and recently a robust risk management system (Lartey, 2012). In addition, the trade marked Economic Value Added has not gained much attention as a measure of performance and for that matter a measure of shareholder value. There is huge evidence that EVA is a better measure of shareholder value than the traditional measures (ROA, ROE, TSR, MVA *etc.*). However, there seems to be little evidence in the Ghanaian case. This thesis seeks to close this gap.

Three macroeconomic factors contribute to make shareholder value creation a primary target in banking namely deregulations and re-regulation, privatization, mergers and acquisitions (Fiordelisi, 2007b). The banking sector is traditionally one of the most regulated industries to assure market competition along with financial stability and efficiency. In order to become competitive banks pursue equity capital which becomes available by supplying satisfactory returns to shareholders. The introduction of the universal banking law as well as the increase in the

minimum capital requirement of Ghanaian banks, and regulatory laws such as The Borrowers and Lenders Act (Act 773), Non-Bank Financial Institution Act (Act 774) *etc.* would lead to the development of innovative strategies to increase shareholder wealth in the Ghanaian banking industry. Moreover, with increasing competition in the Ghanaian banking industry, globalization and influx of foreign banks, it is even more important to take action towards shareholder's interest since according to Gross (2006) higher shareholder value eases access to equity capital. Further, the pressure to increase profits and shareholder's demand for satisfactory remunerations after privatizations make shareholder value a primary target in banking. In addition, when mergers and acquisitions take place, executives and managers are judged base on the value created for shareholders (Fiordelisi, 2007b). The Ghanaian banking industry has witnessed a number of privatitions, mergers and acquisitions. Merchant Bank Ghana was privatized in 2013, TT Bank was acquired by Ecobank Ghana, Intercontinental Bank by Access Bank and BPI by UT Bank.

With respect to the drivers of value, the theoretical work on banks shareholder value is rare and the empirical evidence on the potential drivers in a banking context is somewhat limited (Gross, 2006) particularly in a developing country like Ghana (Mensah & Frimpong, 2013). The empirical evidence of the drivers of performance in the Ghanaian banking industry is at its infancy and even existing studies recommend further investigation into the factors that determine bank performance (Mensah & Frimpong, 2013).

Fiordelisi & Molyneux, (2010a) stated that "while there is a well-established and growing literature that focuses on various factors that influence the performance of banks, few studies use shareholder value created metrics as performance indicator". Moreover, studies analysing shareholder value usually focus on developing and comparing new performance measures (Fiordelisi & Molyneux, 2010b). If the core business of banks is to manage risk in their bid to

increase shareholder value, then understanding which risks factor-buttons (credit risk, market risk, liquidity risk and operational risk) to push in order to create wealth for shareholders will throw more light on sustaining a sound and profitable banking industry.

Focusing on methodology, most studies conducted in the Ghanaian banking industry usually use static models and time series data. Few studies utilise the system Generalised Method of Moments.

1.3. Research Purpose

The purpose of the research is to determine the effect of credit risk, capital risk, liquidity risk, market risk, interest rate risk and operational risk on shareholder value (proxied by Shareholder Value Ratio) and to determine the relationship between SVR, EPR, ROE and ROA.

1.4. Research Objectives

The specific objectives of the research are;

- To determine the risk factors that drive shareholder value in the Ghanaian banking industry.
- To develop and evaluate the SVR (calculated by dividing EVA by capital invested) model for the Ghanaian banking industry.
- To determine the persistence of shareholder value.
- To determine the relationship between SVR, EPR, ROE and ROA.

1.5. Research Questions

The key research questions are as follow;

- What are the potential risk-factors that drive shareholder's value in the Ghanaian banking industry?
- How persistent is shareholder value in the Ghanaian banking industry?
- What is the relationship between SVR, EPR, ROE and ROA?

1.6. Significance of study

The two core activities of banks are risk management and maximization of shareholder value. In maximizing value for shareholders, banks have a responsibility of ensuring that they realize this objective while being exposed to minimal risk. As a result, an evidence of which risk taking behavior of banks affects shareholder value would inform banks and regulators as to which risk exposures should be at the top of their priority list. That is, the research would expose the risk factor buttons to push in order to impact shareholder value in the Ghanaian banking industry.

This research would add to the scanty research on drivers of shareholder value in banking. It would also draw attention of the Ghanaian banking industry to the well accepted financial axiom which is to maximize shareholder value and determine whether Ghanaian banks are indeed creating value for shareholders. Moreover since there seems to be limited research on the trade marked Economic Value Added in Ghana, this research would help create an alternative measure of shareholder value which could replace the traditional measures used in the Ghanaian banking industry.

Maximizing shareholder value is likely to become the focus of the Ghanaian banking industry due to regulations, mergers and acquisition, and competition. This research intends to pave the way for research into bank valuation in the Ghanaian banking industry. This research also represents one of the few studies that account for persistence of shareholder value in the Ghanaian banking industry. Previous studies that focused on the drivers of performance rarely determined the impact of past performance on subsequent performance. This research will expose the effect of past performance in terms of shareholder value on current performance.

1.7. Recent Development in the Ghanaian Banking Sector

Currently, there are 26 universal business licensed banks out of which 15 banks are foreign owned and 7 banks are trading on the Ghana Stock Exchange. The central bank, Bank of Ghana (BOG), is responsible for the supervision and regulation of the activities of the banks. The regulatory and legal framework within which banks, non-bank financial institutions as well as forex bureaux operate in Ghana consists of: the Bank of Ghana Act 2002 (Act 612), Banking Act, 2004 (Act 673) Financial Institutions (Non - Bank) Law 1993, PNDC Law 328, Companies Code (Act 179, 1963), and Bank of Ghana Notices /Directives / Circulars / Regulations (Salami & Lamie, 2013). Apex bank acts as the BOG of the 136 rural/community banks.

Since 2003, the Bank of Ghana has moved away from the three pillar banking model- commercial banking, investment/merchant banking, and development banking onto a new platform of Universal banking. With the passage of the Universal Banking Law, all types of banking can be conducted by the licensed banks. Its introduction has created a level playing field and has opened

the industry to high level of competition, products innovation and entry of new banks (Amidu & Hinson, 2006).

With regards to risk management, the Banking Supervision Department of the Bank of Ghana applies a Risk Based Supervisory Approach to its onsite supervision. The shift towards Risk Based Supervision according to Dosoo (2006) was in line with the introduction of the New Basel Capital Accord (Basel II) which includes operational risk. This put further emphasis on supervisory review process and market discipline, which borders on transparency and full disclosure of financial information. These were intended to provide clear basis for effective management of risks and provision of capital to cover them with the view to making safe and sound banking institutions. The risk based approach enhances a comprehensive and detailed assessment of the risk profile and risk management of the banks.

The Ghanaian banking industry has experienced a lot of changes in recent years. Notably, in 2008, all banks were said to report their financial statements in accordance to the International Financial Reporting Standards (IFRS). The year also marked bank branch growth with the view to extend banking to the doorsteps of customers. E-zwich was also established to enhance the electronic payment and settlement system. In addition, four laws were passed into law by parliament namely; The Borrowers and Lenders Act (Act 773) - to ensure high level disclosure in creditor and borrower relations. It aims to give clarity to lending conditions and rights and obligations of lenders and borrowers; Non-Bank Financial Institution Act (Act 774) - it seeks to provide a framework to provide effective prudential regulation and supervision of the wide range of nonbank financial institutions; Home Mortgage Finance Act (Act 770) - to regulate home mortgage financing and applies to transactions between financial institutions and their customers (mortgagor) to finance the construction, purchase, completion, extension or renovation of residential property either for

ownership, sale or rental; and Anti-money Laundering Act (Act 749) - it seeks to prohibit money laundering and establish a Financial Intelligence Centre. Under the Act, a person commits the offence of money laundering if they knowingly convert, conceal, disguise, transfer, take possession of, or use property forming part of the proceeds of unlawful activity (PwC & GAB, 2009).

In 2009, of the 14 foreign banks in the country, 10 were able to meet the capital requirement of GH¢ 60 million. The banking industry also witnessed the introduction of the “cheque code-line clearing system” by Ghana Inter-Bank Payment and Settlement Systems (GhIPSS). Instead of waiting for three days to clear cheques, this system helps to clear all cheques throughout the country within 48 hours. In addition, banks and insurance companies teamed up to create tailored products to handle customer liabilities (PwC & GAB, 2010).

In 2010, guidelines for licensing and operation of the Credit Bureau under the Credit Reporting Act 2007 (Act 726) was published by the Bank of Ghana which now supports the credit risk management of the industry. In its bid to curb the depreciation of the Ghana Cedi, the central bank of Ghana introduced a number of measures. For instance, the Monetary Policy Committee of the BOG not only increased the policy rate but also reduced the limits on the Net Open Position (NOP) (PwC & GAB, 2012). This was done to improve the attractiveness of the cedi assets and increase the supply of foreign exchange to the market. Secondly to aid the monetary operations the BOG reestablished the 30, 60, and 270 days tenor Treasury Bills. All banks were also required to provide cedi cover for their vostro balances to be maintained at the BOG.

The year 2012 also witnessed the acquisition of The Trust Bank Limited (TTB) by Ecobank Ghana Limited and Intercontinental Bank Ghana by Access Bank and entry of Royal Bank (BOG, 2012).

Ghana Commercial Bank Limited (GCB), First Atlantic Merchant Bank Limited and SG-SSB Bank Limited rebranded by changing their names to GCB Bank Limited, First Atlantic Bank and Société Générale Ghana respectively. At the end of the year, all banks met the new minimum paid up capital of GH¢120 million set by the Bank of Ghana (BOG, 2012).

1.8. Overview of Performance

The depth of importance of the Ghanaian banking industry cannot be underestimated since the banking sector dominates the financial system with an increase in its total asset share of GDP from 39.8% in 2002 to 62.85% in 2010 of the financial systems total contribution to GDP (Amediku, 2013). Between 2007 and 2009, the industry profit before tax decreased from 30.4% to 19.6%. Though income more than doubled (from GH¢ 793 million in 2007 to GH¢1.5 billion in 2009) over the same period, the rapid deterioration of the industry loan portfolio was the reason for the decline in profit margins (PwC & GAB, 2010). However, the industry operating asset grew from GH¢ 12.9b to 2009 to 25.8b in 2012 (PwC & GAB, 2013). The increase over that period was mainly due to a growth in deposits and the rallying by banks to meet the minimum capital requirement of the Bank of Ghana. Industry deposits increased from GH¢ 9.8 b in 2009 to GH¢20.7 b in 2012. Assets are largely held in loans and advances which constituted 41% and 46% of industry operating assets in 2011 and 2012 respectively.

Return on assets (ROA) improved significantly from 2.4% in 2011 to 3.5% in 2012 which could be attributed to an 85% increase in total industry profit (PwC & GAB, 2012). According to PwC & GAB (2011), “Shareholder’s funds grew by 30% from GH¢ 1,794 million in 2009 to GH¢ 2,332 million in 2010”. The growth is mainly due to the capital injection by local banks to meet the

minimum capital and earnings retained to meet statutory reserve requirements. The industry's ROE improved from 12.1% in 2009 to 16.7 % in 2010. The gain in ROE is attributable to an improvement in the industry's net interest margin. The capital injection in the last two years made available cheaper funds to finance banks' operating assets and boost the earning capacity." The economic challenges of 2012 did not have a significant adverse impact on the banking industry as it recorded an average of 23.8% return on equity. There has been a steady increase in ROE over the past four years but it recorded the biggest leap in 2012. As the deadline for the minimum capital requirement closed at the end of December 2012, total industry shareholders' funds increased by 38% to GH¢ 3.95b in 2012 compared to GH¢ 2.86b in 2011. Apart from the GH¢438m capital injection, banks earnings retained by banks grew by 40% (PwC & GAB, 2013).

Amediku (2013) provides empirical analysis of the performance of the six out of the seven listed banks on the Ghana Stock Exchange (GSE). Using data spanning 2000 to 2010, results shows that all the listed banks outperformed the GSE All Share Index. The GSE All Share Index captures the overall performance of the stock market (Kyereboah-Coleman & Agyire-Tettey, 2008). Amediku (2013) concludes that the banks listed shares will not provide portfolio diversification should investors include it in a portfolio of shares since results depicts high positive correlation between the shares of the banks and the GSE All Share Index. However, SCB has the highest risk return ratio whereas CAL has the lowest risk return ratio. GCB outperformed all the listed banks.

1.9. Risk Management by the Bank of Ghana

The Banking Supervisory Department (BDS) of the Bank of Ghana employs an appropriate mix of both onsite and off-site supervision to evaluate the financial condition and risk profile of

financial institutions and conducts periodic meetings with the management of the financial institutions to communicate its supervisory concerns and to discuss corrective measures. The Department also holds trilateral meetings with the financial institutions' management and their external auditors to review audit reports preferably before these reports are published in the newspapers. A study by Salamie & Larmie (2013) on the effectiveness of the Bank of Ghana's regulation and supervision of banks in Ghana reveals that BSD has the appropriate resources: adequate and knowledgeable staff and financial resources, and is well equipped to handle potential crises.

The BDS employs a risk based approach to supervision (BOG, 2012). The risk based approach was formally adopted in 2006.

This approach involves;

- Identification of the significant activities of the financial institution;
- A qualitative assessment of the risks inherent in each significant activity and hence a comprehensive assessment of the risk profile of the financial institution.
- A dynamic and proactive risk assessment process which involves the determination of the “net risk” for each significant activity which is the result of the level of aggregate inherent risk mitigated by the aggregate quality of risk management control function;
- An on-site review which includes an assessment of the quality of operational management as well as the quality of risk management control function(i.e. financial analysis, internal audit, compliance, risk management, senior management control functions); and
- A qualitative determination of the “overall net risk” and quality of the financial institution's capital and earnings.

BSD prepares on a yearly basis, an Institutional Supervision Plan (ISP) which lays down the supervisory activities (on-site/off-site/prudential meetings) it plans to undertake for each of the licensed financial institution. These ISPs become the basis for drawing out the Department's strategy for the year which is then translated into a Departmental Work Plan. The Department also organizes workshops for financial institutions on selected supervision topics such as risk management systems, to discuss exposure drafts of proposed prudential requirements and to introduce new reporting requirements. In some cases, BDS conduct joint studies with the financial sector industry to address specific issues such as calculation of base rates and disclosure requirements.

CHAPTER 2

LITERATURE REVIEW

2.1. Introduction

This chapter discusses the theoretical and empirical evidence on the drivers of performance in banks concentrating on those that deal with the effect of banks risk taking behavior on bank performance. It includes the CAPM.

2.2. The concept of risk

Risk can be defined in several ways depending on the reference point. From the perspective of the concept of wealth and value, Fatemi & Luft (2002) define risk as the volatility of unexpected outcomes as it affects assets and liabilities. According to Fatemi & Luft (2002) there are two main reasons why this volatility (*i.e.* risk) needs to be managed: shareholder value maximization and managerial risk aversion. The shareholder value maximization hypothesis states that firms should engage in risk management activities if it creates value for the firm and thus its shareholder's. The managerial risk aversion hypothesis on the other hand holds that managers will seek to maximize their wealth at the expense of shareholders. Nonetheless risk management needs to be pursued whether shareholder value maximization or managerial aversion is the firm's driving force (Fatemi & Luft, 2002).

Risk can be generally grouped into three: business risk, strategic risk and financial risk. Business risk also referred to as operational risk is inherent in the operations of the firm and thus could be

technological, distributional or informational. If a firm does not manage its operational risk exposures, then the firm stands a little chance of being rewarded for taking on risk (Fatemi & Luft, 2002). As a result the firm may fail. Strategic risk includes macroeconomic factors that affect the firm and by extension, shareholder's value. These events could be economic, political, domestic or international. According to Fatemi & Luft (2002) strategic risk usually have a long-term effect on the value maximization of the firm therefore prudence needs to be exercised when making the firm's long term investment decisions. Conversely, financial risk arises from adverse changes in short term horizons in interest rates, commodity price, equity prices and foreign currency value. Changes in these factors lead to reduction in shareholder value. As business compete for more market and business share, they take on more risk. Therefore implementation of risk management systems is crucial for the survival of the business.

2.3. Risk Exposures of Banks

Banks have been described as being in the business of managing risk. Risk management generally encompasses the process of identifying risks to the bank, measuring exposures to those risks (where possible), ensuring that an effective capital planning and monitoring programme is in place, monitoring risk exposures and corresponding capital needs on an ongoing basis, taking steps to control or mitigate risk exposures and reporting to senior management and the board on the bank's risk exposures and capital positions (BCBS, 2011). Resti & Sironi (2007) states that "Banks must be able to identify, measure, control and above all price all the risks taken aboard, more or less consciously, in and off its balance sheet". This is crucial not only to the bank's profitability, but also to its solvency and future survival, as bank crises always arise from an inappropriate identification, measurement, pricing or control of risks (Resti & Sironi, 2007). Banks are exposed

to several risks but the main risk factors stipulated in the Basel Accords are credit risk, capital risk, liquidity risk, market risk, interest rate risk and operational risk.

2.3.1. Credit Risk

The most important risk that banks are exposed to is credit risk. Resti & Sironi (2007) define credit risk as the possibility that an unexpected change in counterparty's creditworthiness may generate unexpected change in the market value of the associated credit exposure. However, BIS (1999) states that credit risk is most simply defined as the potential that a bank borrower or counterparty will fail to meet its obligations in accordance with agreed terms. The analysis of credit risk is essential because it can provide signs of alarm when the financial sector becomes more vulnerable to shocks. Credit risk comprises of the following main risks; default risk, migration risk, spread risk, recovery risk, pre-settlement risk or substitution risk, and substitution risk.

The increasing variety in the types of counterparties and the ever-expanding variety in the forms of obligations (from auto loans to complex derivatives transactions) has meant that credit risk management has jumped to the forefront of risk management activities carried out by firms in the financial services industry (Fatemi & Fooladi, 2006). As banks give loans, they need to make provisions for loan losses in their books. The higher this provision becomes relative to the size of total loans, the riskier a bank becomes. An increase in the value of the provision for loan losses relative to total loans is an indication that the bank's assets are becoming more difficult to collect (Tsorhe *et al.*, 2011). Credit risk is measured by several ratios. They include (i) net charge off to loans, (ii) credit loss provision to net charge off (iii) loss allowance to loans (iv) loan loss allowance to non-current loans, and (v) non-current loans to loans (Samad, 2012).

According to Fatemi & Fooladi (2006) models used to measure credit risk can be categorized in to two; proprietary (internal) models of credit risk management and the vendor-market models. The latter include; models marketed by Algorithmics, CreditMetrics (by J. P. Morgan), CreditRisk+ (by Credit Suisse), KMV's Portfolio Manager, Loan Pricing Corporation, and McKinsey's Credit Portfolio View. In their survey of the largest financial institutions based in the US, Fatemi & Fooladi (2006) find that identifying counterparty default risk is the single most-important purpose served by the credit risk models utilized. Surprisingly, only a minority of the banks utilize either a proprietary or a vendor-marketed model for the management of their credit risk. In addition, a comparative analysis of credit risk models by Gordy (1998) indicates that despite differences on the surface, the underlying mathematical structures of the two most popular models; CreditMetrics and CreditRisk+ are similar. Empirical work on credit risk focus on macroeconomic factors for instance GDP growth, interest rates, foreign exchange rate, inflation, employment, unemployment that impact it (for example Salas & Saurina, 2002; Louiz *et al.*, 2012; Yurdakul, 2013). Moreover, Samad (2012) identify three significant credit risk variables that predict bank failure in US banks. Applying the probit model he finds that credit loss provision to net charge off, loan loss allowance to non-current loans and non-current loans to loans predict 80.17% of US bank failure. Regarding credit risk in the Ghanaian banking industry, Amidu & Hinson (2006) find that less than 1% of Ghanaian banks are exposed to credit risk.

2.3.2. Capital Risk

Capital, which is shareholder's funds, plays a pivotal role in almost every aspect of banking. Capital needs to be appropriately allocated to various bank business units to maximize its rate of return (Resti & Sironi, 2007). Highly capitalized banks are better able to withstand negative

shocks. As a result, the introduction of the Basel III Accord by the BCBS after the financial crisis proposes new capital requirements for banks. The capital requirement and capital buffer requires banks to hold relatively higher amount of capital than under the Basel II. In Ghana the minimum paid up capital was increased from GH¢ 120 million.

Bank's lending capability is partly determined by its capital since banks cannot lend above the minimum capital requirement. In Ghana, the minimum capital requirement is 10% of the bank's total assets.

2.3.3. *Liquidity Risk*

Liquidity is the ability of a bank to fund increases in assets and meet obligations as they come due, without incurring unacceptable losses (BIS, 2008). Consequently liquidity risk is the probability of not being liquid (Nikolaou, 2009). Therefore the higher the probability, the higher the liquidity risk. In this sense, there is an inverse relationship between liquidity and liquidity risk. Much attention was not given to liquidity risk over the past few years (CEBS, 2008) but lately, it has attained significant attention from researchers, regulators, financial institutions after the 2007-2009 financial turmoil (Arif & Aneez, 2012). During the early stages of the financial crisis, even banks that had higher level of capital suffered. The difficulty experienced by some of the banks can be attributed to lapses in liquidity risk management (BCBS, 2013). According to Jenkinson (2008) liquidity risk not only affect the performance of a bank but also its reputation. A bank may lose the confidence of its depositors if the bank is not able to meet its obligation of providing funds when demanded. Goodhart (2008) posits that there are two basic facets of liquidity risk: maturity transformation (the maturity of a bank's liabilities and assets) and the inherent liquidity of a bank's asset (the extent to which an asset can be sold without suffering a significant loss of value under

any market condition). In fact, these two elements of a bank's liquidity are intertwined. Banks do not need to be worried about the maturity transformation if they have the assets that can be sold without bearing any loss. Whereas, banks having assets that are going to be matured in a shorter period may have a less need to keep the liquid assets. However, Nikolaou (2009) argues that there are three main types of liquidity risk namely;

1. *Central bank liquidity risk* - it has not received attention since it is perceived to be non-existent as the central bank (in this case Bank of Ghana) always provide base money and therefore cannot be illiquid but it can occur in situations of hyperinflation and exchange rate inflation.
2. *Funding liquidity risk* - captures the inability of a financial intermediary to service their liabilities as they fall due.
3. *Market Liquidity Risk* - relates to the inability of trading at a fair price with immediacy. It is the systematic, non-diversifiable component of liquidity risk (Nikolaou, 2009).

Nikolaou (2009) also argues that the three liquidity types are interrelated; a bank would always be liquid as long as it can get enough liquidity to satisfy its funding needs from the markets or the central bank.

During the financial crisis the inefficiency in the allocation of liquidity cost highlighted how inefficient banks were in managing their liquidity exposure. This can be attributed to lack of focus on liquidity risk by supervisory bodies (Leichtfuss *et al.*, 2010).

2.3.4. *Market Risk*

Market risk is the risk that the financial instrument's value will fluctuate as a result of changes in market price, regardless of whether these changes are caused by factors typical for individual instruments or their issuer (counterparty), or by factors pertaining to all the instruments traded on the market (Milanova, 2010). In the same way, Resti & Sironi (2007) hold that market risk means the risk of changes in the market value of an instrument or portfolio of financial instruments, connected with unexpected changes in market conditions. The unexpected changes could be stock prices, interest rates, exchange rates, and volatility of these variables. It includes risks on currency, bond and stock positions, as well as on all other financial assets and liabilities traded by a bank. According to Resti & Sironi (2007), market risk can be categorized into five, namely;

1. *Exchange rate risk*: When the market value of a position is sensitive to changes in exchange rates (this is the case of foreign currency denominated financial assets and liabilities and derivative contracts whose value depends on the exchange rate)
2. *Interest-rate risk*: When the market value of a position is sensitive to changes in interest rates (bonds, forward rate agreements, interest rate futures, interest rate swaps, caps, floors, collars, *etc.*).
3. *Equity risk*: When the market value of a position is sensitive to equity market performance (stocks, stock-index futures, stock options, *etc.*).
4. *Commodity risk*: When the market value of a position is sensitive to changes in commodity prices (cash and forward purchases/sales of commodities, commodity swaps, commodity futures, commodity options, *etc.*).
5. *Volatility risk*: When the market value of a position is sensitive to changes in the volatility of any of the variables considered above (this is typically the case of options).

Market risk can be measured using value at risk models. The US commercial bank J. P. Morgan was one of the first to develop and make public a value at risk model. Value at risk is the measure of the maximum loss that a position or a portfolio of positions can suffer given a certain confidence level, over a predetermined time horizon.

2.3.5. *Interest Rate Risk*

One of the core objective of banks is to transform maturities of assets and liabilities. Banks finance their investments in loans or bonds by issuing liabilities where the maturity of these investments is shorter than that of their liabilities. The mismatch between these assets and liabilities represents the amount of interest rate risk the bank is exposed to. When the maturity of the bank's asset is longer than the maturity of its liabilities then the bank is exposed to refinancing risk. Refinancing risk is the risk that the cost associated with financing an interest-earning position rises, resulting in a lower interest margin. Conversely, a bank is said to be exposed to reinvestment risk if the maturity of its assets is shorter than the maturity of its liabilities. In broad terms, interest rate risk is the risk that changes in market interest rates impact on the profitability of economic value of the bank (Resti & Sironi, 2007). To measure interest rate risk, it important to consider interest bearing liabilities and assets on both side of their balance sheet. The Basel Committee's principle of managing interest rate risk involves; Board and senior management oversight of interest rate risk; adequate interest risk management and procedures; risk measurement, monitoring and control functions; internal controls; generating information for supervisory; and holding capital commensurate with the amount of interest rate risk undertaken.

2.3.6. Operational Risk

Operational risk has become an area of growing concern in banking. The increase in the sophistication and complexity of banking practices has raised both regulatory and industry awareness of the need for an effective operational risk management and measurement system (Moscadelli, 2004). The Basel II Accord defines operational risk as the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events. This definition includes legal risk but excludes strategic and reputational risk (BCBS, 2006). As a result, sound operational risk management is a reflection of the effectiveness of the board and senior management in administering its portfolio of products, activities, processes, and systems ((BCBS, 2011). Even though the definition excludes reputational risk, it is largely acknowledged that operational risk affects the reputation of financial institutions, hence posing a risk higher than the effect of operational risk itself (Sturm, 2012).

As financial institutions have begun to collect loss data and use it to manage operational risk, bank regulators have increased their expectations for measuring and modeling operational risk (de Fontnouvelle *et al.*, 2003). The Basel Committee on Banking Supervision provides three methods of estimating the operational risk charges (ORC). The operational risk charge establishes a minimum amount of capital that banks need to hold to cover their operational risk exposures (Wang *et al.*, 2012). Ranked in terms of degree of complexity the three approaches are; the Basic Indicator Approach (BIA); the Standardized Approach (TSA); and the Advanced Measurement Approach (AMA). Unlike the BIA and SA that use the top-down methodology, the AMA uses the bottom-up methodology which allows banks to use their own internal models to estimate the ORC. Under the BIA the capital requirement for operational risk is equal to 15% of the relevant indicator. The relevant indicator is the average over three years of the sum of net interest income and net

non-interest income. Under the Standardized Approach, the capital requirement for operational risk is the average over three years of the risk-weighted relevant indicators calculated each year across the following business lines; cooperate finance(18%), trading and sales(18%), retail brokerage(12%), commercial banking(15%), retail banking(12%), payment and settlement(18%), agency services(15%) and asset management(12%). There are three methods mentioned in the Basel II Accord that can be used for the AMA namely; Internal Measurement Approach (IMA), Loss Distribution Approach (LDA), and Scorecard Approach (SA). In addition to the three approaches mentioned, other methods include the Extreme Value Theory (EVT), a combination of LDA and EVT, and methods based on computer techniques such as Bayesian Network, Neural network and Dynamical models.

Literature on operational risk tend to focus on developing models for estimating operational risk and its charge (for example de Fontnouvelle Rosengren, 2004; Moscadelli, 2004; Martink, 2007; Chappelle *et al.*, 2008; Jarrow, 2008; Bardoscia & Bellotti, 2011; Wang *et al.*, 2012).

Since the Basel Committee on Banking Supervision's definition of operational risk excludes reputational risk, other research focus on the effect of operational and reputational risk on the price and market value of listed banks (for *e.g.* Cummings *et al.*, 2006; Gillet *et al.*, 2008; Cannas *et al.*, 2009; Solakoğlu & Köse, 2009; Sturm, 2012).

2.4. Bank Risk-taking and Performance.

According to Dietrich & Wanzenried (2011), given the importance of performance/profitability for the stability of the banking industry, and the impact of the banking industry on the capital markets and a country's economy, the question of which value drivers influence performance is of vital importance. There is substantial literature on the determinants of bank performance however

literature on the relationship between bank performance and risk taking is still in its infancy (Zhang *et al.*, 2013). Most studies tend to focus on the bank specific, industry specific and macroeconomic drivers of bank performance- measured by economic value added, shareholder value ratio, ROA, ROE, EPS, TSR, *etc.* (for example, Molyneux & Thornton, 1992; Anthansoglou *et al.*, 2008; Brissimis *et al.*, 2008; Chapelle *et al.*, 2008; Fiordelisi & Molyneux, 2010; Dietrich & Wanzenried, 2011; Arif & Anees, 2012; Cipollini & Fiordelisi, 2012).

Amongst the various bank specific drivers of performance, risk taking behavior has garnered much attention since the recent financial turmoil has revealed loopholes in bank's ability to mitigate the risk they are exposed to. However there is limited literature that focus on bank's risk taking that drive performance.

2.4.1. Credit Risk and Bank Performance

Regarding credit risk, Berger and De Young (1997), Altunbas *et al.* (2000), Brissimis *et al.* (2008), Anthansoglou *et al.* (2008), Alper & Anbar (2011) and Nawaz *et al.* (2012), Zhang *et al.* (2013) find a negative relationship with bank performance. Brissimis *et al.* (2008) conclude that there is a negative relationship between credit risk and majority of bank performance measures (total factor productivity and efficiency). Considering data from sampled Nigerian banks and representing performance by ROA, Nawaz *et al.* (2012) find significant negative relationship with both; non-performing loan to loans and advances; and loans and advances to total deposits. Similarly, Alper & Anbar (2011) find that ratio of loans to asset and loans under follow-up to loans have significant negative impact on ROA in the Turkish banking industry. Dietrich & Wanzenried (2011) also considered several drivers of performance before and after the financial crisis in Swiss banks using data on 376 commercial banks from 1998 to 2009. Results depict no significant effect of credit

risk on performance before the financial crisis. However, they find a negative relationship with performance since loan loss provisions increased during the crisis. In addition, study by Arif *et al.* (2012) expose a minimal role of credit risk in value creation process in banking system of Pakistan. Similarly, Cipollini & Fiordelisi (2012) find that a higher proportion of non-performing loans increases the probability of bank's financial distress.

In contrast to the findings above, Fiordelisi & Molyneux (2010a) find a positive relationship between credit risk and bank performance. Fiordelisi & Molyneux (2010a) argue that since loan loss provisions were not considered in calculating EVA and consequently SVR (measure of performance) hence the positive relationship. They further argue that loan loss provisions are used to smooth profits hence the positive relationship.

2.4.2. Capital risk and Performance

Empirical studies that have examined the impact of capital risk on performance include Mester (1996), Altunbas *et al.* (2000); Altunbas *et al.* (2007), Brissimis *et al.* (2008), Fiordelisi *et al.* 2011; Zhang *et al.* (2013). Mester (1996), Altunbas *et al.* (2000), Brissimis *et al.* (2008) find a negative impact on performance. In contrast, Altunbas *et al.* (2007) find a positive relationship whiles Fiordelisi & Molyneux (2010b) argue that lower levels of capital risk increase efficiency in European banks. Results by Zhang *et al.* (2013) support both findings. In their income based model, they find a negative result but a positive result in the earning asset model of Japanese banks.

2.4.3. Liquidity risk and Performance

Focusing on European banks, Molyneux & Thornton (1992), Fiordelisi & Molyneux (2010a), Cipollini & Fiordelisi (2012), find a negative and significant relationship between liquidity risk

and bank performance. Examining the relationship between profitability and liquidity in Pakistani banks Arif & Anees (2012) also find that liquidity risk affects bank profitability significantly, with liquidity gap and non-performing loans being the two factors worsening the liquidity risk. They have a negative relationship with profitability. But Bourke, (1989), Brissimis *et al.* (2008), Alper & Anbar (2011) find a positive relationship. Brissimis *et al.* (2008) posits that increased liquid assets seem to reduce bank performance hence bank capital may have a strategic role in cases of liquidity shortages and increased credit risk.

2.4.4. Market, Interest rate risk and Performance

The aforementioned studies considered just a few risk factors as bank specific drivers of performance, but Fiodelisi & Molyneux (2010a) included operational and market risk of both listed and unlisted banks. Results depict a negative relationship between shareholder value ratio and market risk. Though interest rate risk and foreign exchange risk can be subsumed under market risk (Resti & Sironi, 2007), some studies deal with the effect market risk, interest rate risk and foreign exchange risk have on performance of listed banks (Choi *et al.*, 1992; Wetmore and Brick, 1994; Atindéhou & Gueyie, 2001; Sukcharoensin, 2013). Employing the GARCH model, Sukcharoensin (2013) finds that large Tai banks are more sensitive to market risk than medium and small banks. Wetmore and Brick find that interest rate risk and exchange rate risk influence stock performance whiles Atindéhou & Gueyie (2001) observed that changes in foreign exchange positively affect stock returns of Canadian chartered banks.

2.4.5. Operational Risk and Performance

Compared to other risk factors, the empirical research on operational risk is young due to lack of data (Sturm, 2013). Consequently, a hand full of studies deal with the impact of operational risk on bank performance.

In their analysis of the implication of the Advanced Measurement Method for assessment of operational risk, Chapelle *et al.* (2008) find that an effective management of operational risk can save banks a substantial amount of money. de Fontnouvelle *et al.* (2003) confirms this by concluding that operational losses are important source of risk for large, international active banks and the capital charge for operational risk will often be greater than the charge for market risk. Cummings *et al.* (2006) using data stemming from the OpVar data base, find that listed US banks and insurance companies experienced a negative price reaction and a drop in market value following an operational loss (at least \$10) announcement. However banks experienced relatively small negative impact and attribute the outcome to a better operational risk management practices following the new regulation of Basel II. Similarly, Gillet *et al.* (2009) attempts to separate operational from reputational risk dealing with 154 operational loss events of US and European Stock Exchange from 1990 and 2004. They find that instances of internal fraud results in the loss in market value of the listed financial institutions. Focusing on bank and insurance fraud as the main source of operational risk, Cannas (2009) conclude that stock prices respond negatively to internal fraud announcement. Sturm (2013) also finds significant negative stock price reaction to first press announcement of operational loss in European financial institutions whereas Solakoğlu & Köse (2009) find negative stock price reaction to announcement of operational loss in the pre-October 2001 period and positive reaction in the post-October period in the Turkish Banking sector.

Other studies consider different drivers of bank performance focusing on other bank risk taking techniques. For example, Aebi *et al.* (2012) investigates whether risk management-related corporate governance mechanisms, such as the presence of a chief risk officer (CRO) in a bank's executive board and whether the CRO reports to the CEO or directly to the board of directors, are associated with a better bank performance during the financial crisis of 2007/2008. Results indicate that banks, in which the CRO directly reports to the board of directors and not to the CEO (or other corporate entities), exhibited significantly higher (i.e., less negative) stock returns and ROE during the crisis.

Using individual bank data from 1996 to 2002 for 734 European banks, Lepetit *et al.* (2007) affirm that higher reliance on non-interest generating activities by banks is associated with higher risk but higher risk is more strongly correlated with commission and fee income than trading activities. Tsorhe *et al.* (2011) using an unbalanced panel of 23 Ghanaian banks covering 2005-2008 find that shareholders do not appear to act in manner that reduces the credit risk taking of Ghanaian banks.

On the whole, some of the above studies reflect controversial results in terms of the impact of bank risk factors on performance. Moreover, despite the clear importance of risk on bank performance, very little empirical evidence have been found concerning the Ghanaian context. There also seem to be few studies that use EVA as a measure of performance.

2.5. Shareholder Value as a Measure of Performance

A popular financial theory is that firm's main objective is to maximize value for its shareholders. The philosophy and idea about value sharing was established in the 1970s and 1980s led by Rappaport who developed the "shareholder value analysis" based on key value drivers for a firm

(McLaren, 2005). Shareholder value has recently gained grounds in the bank valuation such that Wittrup & Jensen (2012) claim that introducing shareholder value based-management would curb future financial crisis. According to Gross (2006), the shareholder value approach is not only an important strategic management tool; its principal objective of shareholder value maximization is vital for banks to exist. Since banks grow by gaining access to equity, maximizing shareholder value will subsequently lead to an increase in shareholder investments (Gross, 2006).

In order to realize this objective of value creation, shareholder value is usually measured by traditional performance indicators (for instance, TSR, EPS, ROE, *etc.*). These performance indicators are used by shareholders and prospective investors to value banks and consequently predict future performances (Worthington & West, 2001). While there is a well-established and growing literature that focus on various factors that influence the performance of banks, few studies use shareholder value creation as their performance indicator (Fiordelisi & Molyneux, 2010a; Wittrup & Jensen, 2012). Fiordelisi & Molyneux (2010b) stated that;

“Studies analysing shareholder value usually focus on developing and comparing new performance measures (e.g. O’Hanlon & Peasnell 1998, Garvey & Milbourn 2000, Fernández 2002), assessing the value-relevance of different company items such performance measures, accounting information, etc. (e.g. Barth & Beaver, 2001, Holthausen & Watts 2001), modelling the link between market value with accounting values (e.g. Ohlson, 1995; Felthman & Ohlson, 1995; Dechow *et al.*, 1999; Lo & Lys, 2000; Ahmed *et al.*, 2000; Liu & Ohlson, 2000; Biddle *et al.*, 2001; Ota ,2002)”.

With regards to studies focused on developing and comparing new performance measures, Stewart (1991) first provided evidence of the correlation between EVA and Market Value Added (MVA). Lehn & Makhija (1996) examined EVA and MVA and found that both EVA and MVA

are correlated positively with stock returns and that this correlation was slightly better than with traditional performance measures such as ROA, ROE and ROS. O'Hanlon & Peasnell (1998) pointed out that EVA index has more superior ability to explain stock price changes than the traditional index. Similarly, Uyemura *et al.* (1996) used a sample of the 100 largest US banks for ten-year period from 1986 to 1995 to calculate MVA and to test the correlation with EVA, as well as four other accounting measures, namely net income (amount), EPS, ROE and ROA. They conclude that EVA is a better measure of shareholder value since it correlates by far ($R^2=40\%$) with the traditional measures.

In their study to determine the relevance of cost efficiency and total factor productivity (TPF) of 143 listed and non-listed European banks over the period of 1998 to 2002, Fiordelisi & Molyneux (2010b) find that TPF changes best explain variations in shareholder value (measured by EVA). In addition, recent study by Xine *et al.* (2012) conclude that it is important and practical to replace traditional indicators with EVA indicator in the performance evaluation of commercial banks in China. However, Fernández (2002) finds opposite results. Fernández (2002) analysed 582 American companies using MVA, EVA, NOPAT and WACC. Results show that 296 out of the 582 companies, the correlation between increase in MVA and NOPAT was greater (averagely 22.5%) than EVA and WACC. There were 210 companies for which the correlation between MVA and EVA was negative. Similarly, in contrast to studies supporting the superiority of EVA, Biddle *et al.*, (1997) find that traditional accounting measures, generally, outperformed EVA in explaining stock returns. The same results came from Worthington & West (2001) for the Australian context. Though there are conflicting results about the superiority of EVA in representing performance, generally studies conducted conclude that it the best performance indicator for shareholder value. Despite the growing literature on the use of EVA as performance measure there seems to be no

research on it in the Ghanaian banking industry. Performance is usually measured by ROE or ROA (for instance Acheampong, 2013; Aboagye-Debrah, 2007; BOG, 2012). To the best of our knowledge, the only work that used EVA as measure of performance in Ghanaian banks was Mensah & Frimpong (2013) research on banks specific and macroeconomic drivers of performance. Not only was EVA calculated using WACC but also they made only one adjustment to NOPAT. Moreover they did not consider the effect of risk taking behavior of banks shareholder value.

2.6. Economic Value Added

Economic Value Added (EVA) is a residual value measure developed by the consulting company Stern Stewart & Co and among the most widely used measures of shareholder value. Stewart (1991) argues that EVA is the financial performance measure that comes closer than any other to capturing the true economic profit of an enterprise. EVA also is the performance measure most directly linked to the creation of shareholder wealth over time (Stewart, 1991; Shil, 2009). McLaren (2005) defines EVA as the surplus that remains after deducting the cost of investment over a period. However, Wittrup & Jensen (2012) stated that EVA equals the spread between return on net assets and the cost of capital, multiplied by invested capital. In relation to banks, Fiordelisi & Molyneux (2010a) posit that EVA is calculated as the difference between “economic measure” of the bank’s net operating profits and a capital charge over the same period, i.e. the product of invested capital in the bank and the estimated cost of capital. If the EVA is positive, the company creates shareholder wealth. Negative EVA indicates that shareholder wealth is destroyed (Stewart, 1991). Consequently, in order to affect EVA banks have three bottoms to push: Net operating profit, opportunity cost of capital and invested capital. To increase shareholder value, banks need

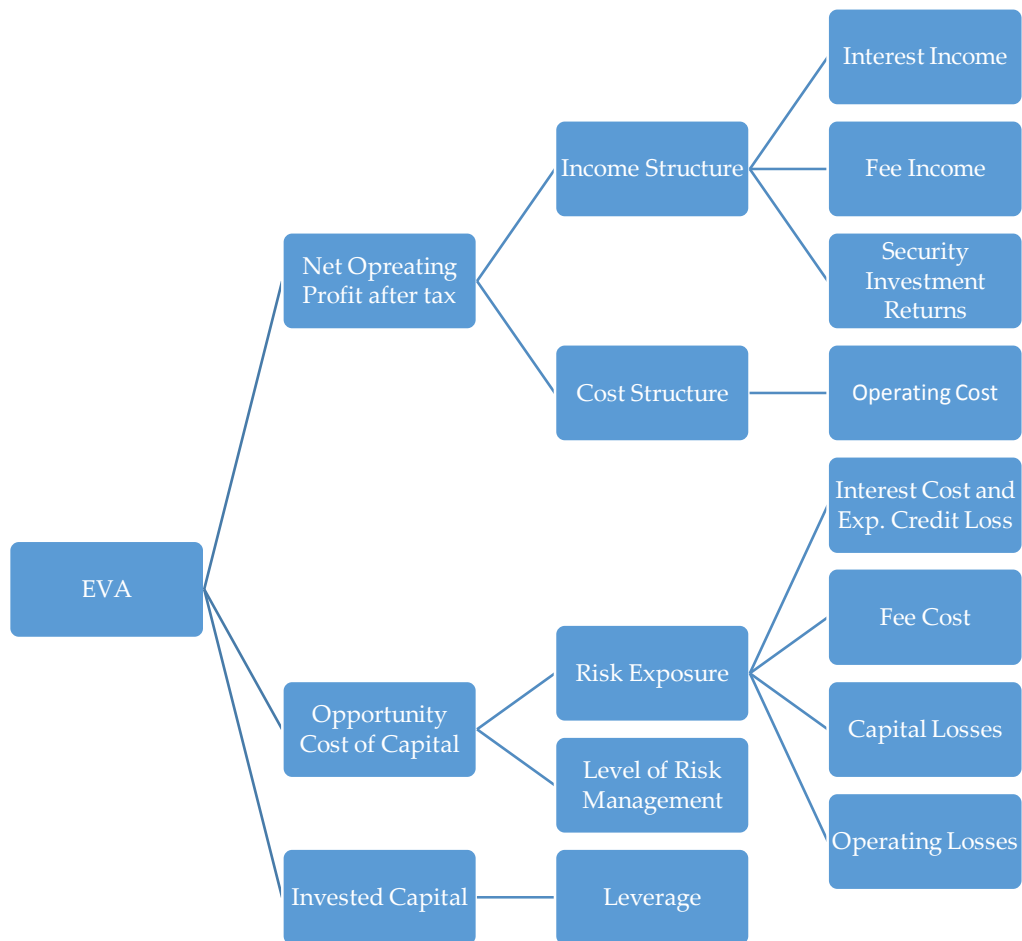
to increase the net operating profits and/or reduce the opportunity cost of capital and/or reduce the capital invested.

From Fig. 1, net operating profits improvements depend on;

- a. bank income and cost structures in particular: net interest margins (i.e. interest revenues minus interest costs and expected credit losses),
- b. fee income (i.e. fee revenues less fee costs),
- c. security investment returns (i.e. capital gains plus dividends less capital losses from bank stock investments) and
- d. operating costs.

These revenues and costs depend on bank-specific factors (namely, cost and profit efficiency, bank risk-taking, financial structure, deposit and loan growth rates, *etc.*) as well as industry-level factors (e.g. industry concentration, bank market power, *etc.*) and country-level factors (e.g. country richness and demographic features). In the same way, the opportunity cost of capital (i.e. the rate of return required by shareholders for investment with a similar risk level) depends on the riskiness of future cash flows. The opportunity cost of capital may be reduced by reducing risk exposure or improving risk management. Finally, capital invested can be reduced by increasing financial leverage (Fiordelisi & Molyneux, 2010a).

Fig 1: The Value Drivers according to Fiordelisi and Molyneux (2010a)



Source: Wittrup and Jensen (2012)

Mathematically,

$$EVA_t = NOPAT_t - (\text{Capital Invested}_{t-1} \times \text{Cost of Capital})$$

Where;

EVA_t = Economic value added for time period t

$NOPAT_t$ = Net operating profit after tax for time t

Capital_{t-1} = Book value of equity capital/capital invested at the start of time t-1

NOPAT and Capital Invested are not calculated in the same period as investors compare return (NOPAT) earned over the period with Capital invested at the end of the period and not the beginning. As a result Capital invested is calculated with a lag of one year. Moreover, NOPAT and Capital Invested cannot be simply calculated by using accounting figures (book value). Consequently, some adjustments are made to it. Over 160 adjustments have been identified but it is unrealistic to make these adjustments even for a single company (Stewart, 1991; Fiordelisi & Molyneux, 2008). However seven adjustments have been identified to move the book value of banks closer to their economic value.

The adjustments concern the following;

1. Research and Development Costs and Training Costs
2. Operating Lease expenses
3. Loan Loss Provisions and Loan Loss Reserves
4. Taxes
5. Restructuring Charges
6. Security Accounting
7. General Risk Reserve

The first two adjustments can be applied to any kind of company while the rest are specific to commercial banks (Fiordelisi & Molyneux, 2008). EVA goes for adjustments to make it economically viable and correct distortions that are very much prevalent in the information generated by conventional accounting (Shil, 2009).

According to Fiordelisi & Molyneux (2010a), if the capital charge/cost of capital is calculated following a standard procedure (i.e. applying Weighted Average of Cost of Capital (WACC) on total assets), EVA will be biased since it will double count the charge on debt. Therefore in the

case of banks it is appropriate to calculate the capital invested focusing on equity capital. Since bank's core business is financial intermediation, interest expenses should be treated as an operational cost rather than financial cost (as for other firms). As a result, the capital invested in the bank is measured as the book value of total equity and the cost of capital as the cost of equity. For listed banks the cost of equity is estimated using the Capital Asset Pricing Model (CAPM) and for non-quoted/non-listed banks, the mean of the cost of equity capital for comparable domestic quoted banks (Fiordelisi & Molyneux, 2010a).

2.7. The Cost of Equity Capital

The Capital Asset Pricing Model (CAPM) developed by Sharpe and Litner has become the backbone in finance for estimating the cost of capital of a firm. According to the model, the cost of equity capital of a firm is determined by the systematic risk of the firm. It has received mounting of criticisms (for e.g. Ball & Brown, 1968; Banz, 1981; Basu, 1983; Rosenberg *et al.*, 1985; DeBondt & Thaler, 1985; Jegadeesh & Titman, 1993; Fama & French 1993). While Ball & Brown (1968) find that past earning announcements influence average stock performance, Banz (1981) posit that stock returns are related to firm size. In addition, Rosenberg *et al.* (1985) hold that book-to-market value of equity has significant impact on stock returns, whereas DeBondt & Thaler (1985) and Jegadeesh & Titman (1993) find stock returns to be dependent on past returns. The most outstanding evidence against the one factor model CAPM is the findings of Fama & French (1993). Fama & French (1993) argue that two additional risk factors beyond the stock market factor used in estimating the CAPM are necessary to fully characterize economy-wide risk in stocks. Fama & French (1993) proved that firm size and the book-to-market ratio are the main factors in explaining the returns on a large sample of nonfinancial firms. In support of Fama &

French (1993), Harvey (1995) finds that the shortcomings of the one factor CAPM are more pronounced in emerging markets. Out of the 20 countries (including African countries) considered, only seven had betas significantly different from zero. Other groups of studies on CAPM also challenge the findings of Fama & French (1993). According to Jaganathan & Wang (1996) the results obtained by Fama & French (1993) could have been influenced by missing assets in the proxy for market portfolio and the business cycle. Knez & Ready (1997) also posit that extreme samples explain Fama & French (1993) findings. Moreover, empirical studies on the behavior of bank stock returns have found that an interest rate factor adds substantial explanatory power to the single factor CAPM (Viale, 2009).

Although there is ongoing debate about the efficacy of the one factor CAPM, a survey by Graham and Harvey (2001) indicates that 73.5% of the chief financial officers still use the CAPM for capital budgeting. Further, Da *et al.* (2008) suggests that in spite of the huge evidence against the efficacy of the single factor CAPM, firms should continue to use it in capital budgeting and consequently as a measure of cost of equity capital.

CHAPTER 3

METHODOLOGY

3.1. Introduction

This chapter discusses the analytical framework and diagnostic tools employed to obtain the results. It also includes data and the estimation techniques used.

3.2. Data

The research relies on data obtained from the Banking Supervisory Department and Research Department of the Bank of Ghana. Data spanning 2007 to 2013 for each bank was obtained from their financial statements while the identity of the banks kept anonymous. Out of the 26 licensed banks, 25 was included in the analysis due to limited data on the new entrant bank. The research was designed to deal with both listed and non-listed banks. Monthly stock prices of 6 listed banks, monthly return of the GSE-ASI, and the 91- day Treasury Bill Rate were obtained from the Ghana Stock Exchange. Data on GDP per Capita was obtained from the World Bank Database.

3.3. Research Design

The design of the research takes an exploratory; quantitative approach, meaning a formal, objective, systematic process where data are analyzed were used. The data for the analysis was organized as an unbalanced panel dataset. The panel is unbalanced as a result of mergers, acquisitions and entry of new banks during the period. According to Anthasoglou *et al.* (2008) unbalanced panel is likely to be the norm in country specific bank profitability.

Panel data makes the estimators in the model more reliable and accurate than cross-sectional and time series data because of the availability of repeated observations of the same unit (Verbeek, 2009). In addition, broader range of issues and more complex problems can be tackled with panel data than would be possible with pure time-series or pure cross-sectional data alone (Brooks, 2008). Other advantages of panel data according to Baltagi (2001) as stated by Wittrup & Jensen (2012) are;

- a. It controls for individual heterogeneity and avoids the risk of obtaining biased results
- b. It better studies the dynamics of adjustment than cross-sectional and time series data
- c. Panel data gathered on micro units are more accurately measured and results in less bias.

To test the relationship between bank risk exposures and shareholder value we followed the lines of Berger & Bonacorssi di Patti (2006), Anthansoglou *et al.* (2008), Brisimiss *et al.* (2008), Fiordelisi & Molyneux (2010a) and Arif *et al.* (2012).

The following model was estimated where shareholder's value is a function of risk factors and control variables.

$$Y_{i,t} = \sum_{j=1}^2 \beta_j Y_{i,t-j} + \sum_{j=1}^2 \rho_j CRED_{i,t-j} + \sum_{j=1}^2 \theta_j CAP_{i,t-j} + \sum_{j=1}^2 \delta_j LIQ_{i,t-j} + \phi MARK_{i,t} + \omega INT_{i,t} \\ + \sum_{j=1}^2 \vartheta_j LN(OP)_{i,t-j} + LN(GDPP)_t + \phi LB_{i,t} + \varepsilon_{i,t} \dots \dots \dots \mathbf{I}$$

Where i subscript represents the cross-sectional dimension (banks) and t denotes the time dimension (years). $\varepsilon_{i,t}$ is the sum of μ_i the unobserved bank specific effect and $v_{i,t}$ the observation specific errors. We specify AR(2) (the first and second lags) for those factors that may take time to influence shareholder value. According to Fiordelisi & Molyneux (2010a) a relative large number of lags are required to determine how quick bank's actions quickly payoff. Though

Fiordelisi & Molyneux (2010a) used three lags, we used two lags due to limited sample size and short time period.

3.4. Justification of Variables

Table 1 displays the variables used in the analysis and their respective symbols and definitions.

Table 1: Definitions, notations and expected effect of explanatory variables

Variable	Symbol	Description	Expected effect
Shareholder Value Ratio	SVR/Y	SVR is measured as the ratio between Economic Value Added and the Capital invested at time t-1.	
Credit Risk	CRED	CRED is obtained as the ratio between the annual loan loss provisions to total loans.	<i>Negative/Positive</i>
Capital Risk	CAP	CAP is obtained as the ratio of total equity to total assets	<i>Negative</i>
Liquidity	LIQ	LIQ is calculated by the ratio between total loans to total deposits	<i>Negative</i>
Market Risk	MARK	MARK is calculated as the ratio between total amount of security investments and total assets	<i>Negative</i>
Interest Rate Risk	INT	INT is calculated using the Gap Ratio, which is given by the ratio of interest rate sensitive assets to interest rate sensitive liabilities.	<i>Negative</i>
Operational Risk	OP	OP is calculated by the capital charge required under the Basel II basic indicator approach.	<i>Negative</i>
GDP per Capita	GDPP	GDPP is the gross domestic divided by midyear population.	?
Listed Bank	LB	LB is a dummy variable which indicates whether the bank is listed or not	?
Economic Profit Ratio	EPR	EPR is measured as the ratio between the Net Operating Profit and the capital invested at time t-1.	
Return on Equity	ROE	ROE is measured as the ratio of profits after tax to average shareholder's fund	
Return on Assets	ROA	ROA is measured as the ratio of profit after tax to total assets	

3.4.1. Shareholder Value Ratio (SVR)

The Shareholder Value ratio was calculated by dividing EVA by the Capital Invested at time t-1 following the procedure used by Fiordelisi & Molyneux (2010a). The shareholder value ratio in essence appears to replicate ROE however it is different in the sense that it makes use of EVA.

3.4.2. Economic Value Added (EVA)

Previously, amongst the traditional measures of performance, ROE is the most popular measure of shareholder value. However, the recent crisis has shown that ROE is not good at discriminating the best performing bank from the other (ECB, 2010). ROE depicts short term performance and its weakness becomes even more obvious in times of distress. Measuring performance goes beyond just considering ROE; it must be refined to reflect the risk incurred in attaining such returns. One possible refinement of ROE is the EVA. Theoretically, it is the most relevant measure of performance since it balances economic return with risks (ECB, 2010). Consequently, this research makes use of EVA because it has also become the most reliable and popular measure of shareholder value (Arif *et al.*, 2013; Wittrup & Jensen, 2012; Bistrova & Lace, 2012; Reddy *et al.*, 2011; Fiordelisi & Molyneux, 2010a; McLaren, 2005; Celik & Aslanertik, 2011; Malmi Ikäheimo, 2003; Worthington & West, 2001).

EVA is given by the difference between the Net Operating Capital after Tax (NOPAT) and the product of capital invested and the cost of capital. According to Stewart (1991), Fiordelisi & Molyneux (2010a) among others, it is the only measure that comes closest to measuring the true value created for shareholders since it considers the cost of capital. Moreover, there is huge evidence that the EVA is a better measure of shareholder return than the traditional indexes (Stewart, 1991; Lehn & Makhija, 1996; Uyemura *et al.*, 1996; O'Hanlon & Peasnell, 1998; Xin'e *et al.*,

2012). The cost of capital in the case of banks is calculated using the Capital Asset Pricing Model and not the Weighted Average of the Capital Invested. According to Fiordelisi & Molyneux (2010a) using the Weighted Average of Cost of Capital will double count debt and recommended the use the Capital Asset Pricing Model to calculate the cost of capital.

EVA was estimated by;

$$EVA_{i,t} = NOPAT_{i,t} - K_{i,t-1} \times CoE_{i,t} \dots\dots\dots \text{II}$$

Where i subscript represents the cross-sectional dimension (banks) and t denotes the time dimension (years).

$$NOPAT_{i,t} = \text{Net Profit after Tax} + \text{Training Expenses and Operating Lease Expenses} \dots\dots\dots \text{III}$$

NOPAT was adjusted to reflect training expenses and operating lease expenses. Training expenses are expenses which are aimed to spawn future growth, hence represents intangible investments and should be included in the income statement of the bank. As such they should be treated the same way as investments in tangible assets. This distortion was corrected to account for the economic benefits or improvements training expenses would generate by adding back this expenses to NOPAT. The operating leases are disguised financial expenses since companies acquire a productive asset and therefore, finance their future production by paying periodic rent (i.e. operating leases expenses). In the same way, the operating expenses were added to NOPAT to correct the distortions of accounting operating profits.

$$K_{i,t-1} = \text{Capital Invested}$$

Capital invested was represented by shareholder's equity. In the Ghanaian banking industry this is represented by shareholder's fund.

$$CoE_{i,t} = \text{Cost of Equity Capital Invested}$$

3.4.3. *Estimating the Cost of Equity Capital*

The cost of equity capital of a firm is given by the CAPM (Copeland *et al.* 1996). CAPM involves calculating beta where beta is the covariance between the return on the firm's common stock and the market index. Consequently, beta measures the systematic risk of the stock and knowing the systematic risk, we can determine the required rate of return using the CAPM. This required rate of return represents the opportunity cost of capital; the rate of return required by shareholders for investment with a similar risk level.

The CAPM is given by;

$$E(R_{i,t}) = R_{f,t} + [E(R_{m,t}) - R_{f,t}]\beta_i \dots\dots\dots \text{IV}$$

Where;

$E(R_{i,t})$ = the expected return (cost of equity capital) of bank i at time t ,

$R_{f,t}$ = the risk free rate at time t ,

$E(R_{m,t})$ = the expected return on the market index at time t , and

β_i = the beta of bank i .

In estimating the return (cost of capital invested) of listed banks, we first estimated their betas. The market index was proxied by GSE All Share Index and risk free rate was proxied by the 91-day Treasury Bill Rate. The full-sample betas of the listed banks were estimated using the Ordinary Least Squares Method. For non-listed banks, estimated cost of capital was proxied by the average cost of capital of the listed banks.

3.4.4. *Credit Risk (CRED)*

Credit risk is the single most important risk faced by banks therefore its effect on the value creation process is relevant. It is proxied by several ratios however this thesis makes use of the ratio of total

loan loss provisions to total loans as found in empirical literature (e.g. Anthasoglou *et al.*, 2008; Brisimmis *et al.*, 2008; Cipollini & Fiordelisi, 2012; Samad, 2012). The higher the ratio the higher the credit risk exposure of the bank and vice-versa. This is because a bank that has a relative higher loan loss reserve must have given out loans to borrowers who have higher propensity to default hence would reserve huge amounts to accommodate any future uncertainties. AR(2) of credit risk was specified since its impact on shareholder value may not be immediate.

3.4.5. Capital Risk (CAP)

Capital risk is proxied by ratio of capital invested to total assets following Brissimiss *et al.* (2008) and Zhang *et al.* (2013). It is the proportion of the bank's asset that is represented by shareholder's equity. Increased levels of capital (lower capital risk) act as a safety net in the case of adverse events. AR(2) of capital risk was specified since its impact on shareholder value could take time.

3.4.6. Liquidity Risk (LIQ)

Liquidity risk is proxied by the ratio of total loans to total deposit following the work of Fiordelisi & Molyneux (2010a). The conviction is that banks use long term deposits for short term loans in order to generate interests. Therefore banks are exposed to liquidity risk if there is mismatch between maturity of the loans and when the bank is expected to perform its obligation of meeting the demands of depositors. AR(2) of liquidity risk was specified since its impact on shareholder value could take time.

3.4.7. Market Risk (MARK)

Market risk is represented by the ratio of total security invested to total assets as used by Fiordelisi & Molyneux (2010a). This represents the proportion of the bank's assets that is at risk to changes in market conditions such as interest rate, foreign exchange rate and commodity prices.

3.4.8. Interest Rate Risk (INT)

Interest rate risk is measured using the gap ratio method. The gap ratio has the advantage of being unaffected by the size of the bank therefore makes is a suitable proxy for comparing different sized banks (Resti & Sironi, 2007). In addition, it also takes into account the evolution of bank's exposure to interest rate risk. The gap ratio is given by dividing interest rate sensitive assets by interest rate sensitive liabilities. In this work, interest rate risk was calculated as the ratio of average interest rate sensitive assets to average interest rate sensitive liabilities.

3.4.9. Operational Risk (OP)

The operational risk exposure of the banks was calculated using the Basic Indicator Approach stipulated in the Basel II Accord. This involves calculating the capital charge as a measure of operational risk indicator. The capital charger according to the Basel II Accord is calculated as 15% of the gross income over the past three years ignoring those years where income was not positive. The average income is the sum of net interest income and net non-interest income divided by those years when income was positive. AR(2) of operational risk was specified since its impact on shareholder value may not be instant.

3.4.10. ROE, ROA and EPR

In order to ascertain whether Ghanaian banks are indeed creating value, we determined the relationship between Return on Equity, Return on Asset and Shareholder Value Ratio. ROE and ROA are the two main measures of performance in the Ghanaian banking industry therefore we test the relationship with shareholder value ratio. Return on equity is the ratio of net income to average total equity whereas return on asset is the ratio of net income to average total assets. A closely related measure of Shareholder Value Ratio is the Economic Profit Ratio. It is calculated by dividing Net Operating Profit by capital invested.

3.4.11. Control Variables

GDP per Capita and a dummy for listed and non-listed bank were used as controls. GDP per Capita is the gross domestic product divided by the midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the products. LB is a dummy variable where 1 denotes the bank is listed on the Ghana Stock Exchange and 2 denotes the bank is no listed.

3.5. Model Estimation Technique.

We estimated the model (equation I) using the system Generalized Method of Moments. The generalized method of moments (GMM) refers to a class of estimators which are constructed by exploiting the sample moment counterparts of population moment conditions of the data generating model. GMM estimators have become widely used for the following reasons;

1. GMM estimators have large sample properties that are easy to characterize in ways that allow comparison. The estimators also provide a natural way to construct tests which account for sampling and estimation errors.
2. It is useful to researches because there is no need to specify the full data generating process

In estimating a dynamic panel model such as equation 1, the introduction of lagged dependent variable among the explanatory variables makes the OLS estimator biased since the lagged dependent variable becomes correlated with the error term. To solve this problem, the approach proposed in literature is to focus on differentiated equation. For instance;

$$y_{i,t} - y_{i,t-1} = \beta(x'_{i,t} - x'_{i,t-1}) + \gamma(y_{i,t-1} - y_{i,t-2}) + (\varepsilon_{i,t} - \varepsilon_{i,t-1}) \dots \mathbf{V}$$

Since the error term $(\varepsilon_{i,t} - \varepsilon_{i,t-1})$ is now correlated with $(y_{i,t-1} - y_{i,t-2})$ the OLS estimates become biased therefore Anderson & Hsiao (1981) suggests using either $y_{i,t-2}$ or $y_{i,t-3}$ as instrumental variables to solve this problem. The instrumental variables become uncorrelated with the error term but now correlated with $(y_{i,t-1} - y_{i,t-2})$. Building on the work of Anderson & Hsiao (1981) and Holtz-Eaken *et al.* (1988), Arellano & Bond (1991) developed a one-step and two-step generalized method of moment estimators for the difference equation. Arellano & Bond (1991) used all the lagged values of the dependent variable and lagged values of all endogenous variables as instrumental variables. This was criticized by Arellano & Bover (1995) who claim that for panels with short time periods, the estimator is inefficient if the instrument used are weak predictors of endogenous changes. Blundell & Bond (1998) also showed weakness in using lagged level of dependent variable as instruments. As a result, Blundell & Bond (1998) proposed the system GMM estimator that uses moment conditions in which lagged differences are used as instruments for the level equation in addition to the moment conditions of lagged levels as

instruments for the differenced equation. Blundell and Bond (1998) showed using Monte Carlo simulations significant advantages of system GMM over the traditional GMM developed by Arellano & Bond (1991). The advantages of the system GMM relative to the traditional GMM is that it accounts for situations where the autoregressive parameter is close to unity and the number of time series to number observation is relatively small.

From methodology viewpoint, models used in literature to determine the drivers of bank performance are usually OLS, fixed effect and random effect models. GMM is currently gaining popularity in academia as the best estimator especially in the case of small time period large panel dataset. Studies on determinants of bank performance that make use of GMM estimator include Anthasoglou *et al.* (2008), Fiordelisi & Molyneux (2010a), Lee & Hsieh (2013).

The nature of the data set for this research requires that the system Generalized Method of Moments estimator developed by Arellano & Bover (1995) and Blundell & Bond (1998) is used. The reasons for using system GMM are;

The explanatory variables in equation I are likely to be endogenous. That is there might be a reverse causality; the explanatory variables is caused by the dependent variable and vice versa. Moreover, the explanatory variables could be correlated with the error term. To solve this problem the system GMM uses the lagged levels of endogenous regressors in addition to the exogenous variables. This makes the endogenous variables predetermined and, therefore not correlated with the error term. Secondly, time-invariant characteristics (fixed effects), such as bank ownership may be correlated with the explanatory variables. The error term ($\varepsilon_{i,t}$) in equation I consists of the unobserved bank specific effect (μ_i) and the observation specific effect ($v_{i,t}$). To cope with this problem, the system GMM uses first difference to transform the equation (eg. Equation V). By transforming the model

using first differencing, the fixed bank-specific effect is removed because it does not vary with time.

Thirdly, the presence of lagged dependent variable creates the problem of autocorrelation. The system GMM corrects this by instrumenting with the past levels of the first differenced lagged dependent variable.

Finally, the panel dataset has a short time dimension (7 years) and a large bank dimension (25 banks). The effect of time-invariant characteristics of a panel data that has a large time dimension dies off with time. Consequently, the correlation of the lagged dependent variable with the error term will be insignificant. The Arellano & Bover (1995) and Arellano & Bond (1998) estimator is designed to handle small time dimension large observation panels.

Two specific tests were conducted to ensure the consistency of the system GMM estimator;

1. The Arellano-Bond test for zero autocorrelation in the first difference errors

The moment conditions specified by the Arellano & Bond (1991) are only valid if the first differenced error terms are not correlated. We test first and second order autocorrelation of the first differenced error terms. The null hypothesis is that the error terms are not serially correlated. Because the difference of independent and identically distributed errors will be serially correlated, rejecting the null hypothesis at order one (i.e. AB(1)) does not mean the model is wrongly specified. But rejecting the null hypothesis of no autocorrelation at order two (i.e. AB(2)) implies that the moment conditions are not valid.

2. Sargan Test of Overidentifying Restrictions

This tests whether the instruments used are valid; the overidentification moment conditions are valid. The null hypothesis is that the overidentifying restrictions are valid. Rejecting the null hypothesis means that we need to reconsider the model estimator unless it is attributed to heteroskedasticity. Failure to reject the null hypothesis in the Arellano-Bond and Sargan test will support the model specification.

3. The Wald χ^2

The Wald χ^2 tests whether the regressors used explain variation in the dependent variable. The null hypothesis is that the coefficients of the regressors are jointly zero. Rejecting the null hypothesis will indicate that at least one of the independent variables considered impacts shareholder value.

CHAPTER 4

EMPERICAL RESULTS AND DISCUSSIONS

4.1. Introduction

This chapter presents descriptive statistics and a thorough explanation of the diagnostic tests performed. We also explain the correlation between the variables considered as well as the estimates and robustness of the results by using other measures of performance and model specifications.

4.2. Descriptive Statistics

Table 2 displays the descriptive statistics of the variables used in the analysis. In general, and on the average, banks created value in terms of shareholder value ratio, economic profit ratio and return on equity. But there were times that value was destroyed that is return to shareholders was negative. It can be observed that SVR and EPR do not differ since they have almost equal descriptive statistics. Some observations were missing due to the autoregressive process used to determine the short term effect of the risk taking behavior of the banks.

Turning to the risk taking variables, liquidity risk which represents bank's financial ratio shows that loans amount to, on the average, 77% of total deposits while provision for loans amount to just 3% of total loans. The minimum credit risk is zero which means there was a time where a bank did not make provisions for bad debts probably because the bank was a new entrant in the banking

industry. Regarding capital risk, 16% of bank's total assets is represented by shareholder's equity.

LB is a dummy variable with 1 representing a listed bank while 2 represents non-listed bank.

Table 2: Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
SVR	167	0.281979	0.307795	-0.56894	1.872704
EPR	167	0.29783	0.310327	-0.54986	1.882913
ROE	167	0.167701	0.20754	-0.68308	0.703389
ROA	167	0.033556	0.047482	-0.20675	0.404041
CRED	167	0.026097	0.023197	0	0.113858
CRED _{t-1}	142	0.025614	0.024151	0.02493	0.113858
CRED _{t-2}	117	0.02535	0.024511	0.02493	0.113858
CAP	167	0.167299	0.132366	0.030405	0.870443
CAP _{t-1}	142	0.164694	0.137124	0.030405	0.870443
CAP _{t-2}	117	0.159757	0.14067	0.030405	0.870443
LIQ	167	0.765903	0.344518	0.056506	2.071362
LIQ _{t-1}	142	0.760097	0.356851	0.056506	2.071362
LIQ _{t-2}	117	0.768919	0.376756	0.056506	2.071362
MARK	167	0.243334	0.134341	0	0.770332
INT	167	1.30881	0.7093	0.432418	7.283841
LNOP	167	15.57335	1.270474	11.60084	17.97565
LN(OP) _{t-1}	142	15.41953	1.260294	11.60084	17.77238
LN(OP) _{t-2}	117	15.27197	1.263345	11.60084	17.60262
LN(GDPP)	167	7.224033	0.172849	7.000334	7.448625
LB	167	1.748503	0.435178	1	2

As shown in Table 3, some of the variables used exhibit statistically significant correlation. Correlation among the dependent variables leads to multicollinearity which produces unreliable estimates through large variance in the estimated coefficients (Wooldridge, 2009).

But the magnitude of the correlation between the variables used in the model is usually lesser than 50%, hovering around 35%. However, the correlation between capital risk and two other variables (interest rate risk and operational risk) is slightly above 50%. This suggest that our models do not

suffer from multicollinearity. Thus the models produced reliable and consistent estimates. The correlation between SVR and EPR is highly positive as expected since EVA is calculated by subtracting the cost of equity capital from net operating profit. Similarly, the correlation between SVR and ROE as expected is very high (77%).

As stated earlier, interest rate risk can be subsumed under market risk. Nonetheless, the Pearson's correlation coefficient between them shows insignificant correlation. We find that whether a bank is listed or not has no significant correlation with shareholder value ratio. Interestingly, it has negative correlation with economic profit ratio and return on equity.

Table 3: Pearson's Correlation Coefficient of Variables

	SVR	EPR	ROE	CRED	CAP	LIQ	MARK	INT	LN(OP)	LN(GDPP)	LB
SVR	1										
EPR	0.915***	1									
ROE	0.773***	0.7664***	1								
CRED	-0.3703***	-0.3597***	-0.5034***	1							
CAP	-0.2422***	-0.2419***	-0.1886***	0.0132	1						
LIQ	0.0475	0.0542	0.04	0.0642	-0.0156	1					
MARK	-0.0764	-0.0817	-0.0138	0.0987	0.3504***	-0.4407***	1				
INT	-0.1281*	-0.1231	-0.0179	0.0934	0.5294***	0.101	0.4239***	1			
LN(OP)	0.2985***	0.3035***	0.487***	-0.026	-0.5023***	0.0576	-0.0125	-0.1513***	1		
LN(GDPP)	-0.0274	-0.021	0.08	-0.0114	0.13*	-0.1087	0.243***	0.0041	0.3971***	1	
LB	-0.1265	-0.1313*	-0.3655***	0.254***	0.145*	-0.1352*	0.12	0.1286*	-0.4104***	0.0261	1

The symbols *, **, *** represent significance at 10%, 5%, and 1% respectively

4.3. Diagnostic Tests

In order to determine whether the specified model fits the data, we perform the Sargan, Arellano-Bond and Wald tests as discussed in Chapter 3. This is necessary in order to obtain consistent empirical results so as to draw reliable conclusions and policy recommendations.

Table 4 displays Sargan test of overidentifying restrictions. The null hypothesis is that overidentifying restrictions are valid. This tests whether the instruments used are not correlated with the residuals. We identified 30 instruments. We fail to reject the null hypothesis since the p-value is 0.2427 and conclude that, the overidentifying restrictions are valid. As stated earlier, failure to reject the null hypothesis of the Sargan test supports the system GMM estimates.

Similarly, we test for zero autocorrelation in the first-differenced errors (see Table 4). The GMM assumption is that, the first difference errors should not be serially correlated. The hypothesis of the Arellano-Bond test for zero autocorrelation is that the differenced errors term is not first order or second order serially correlated. Again, we fail to reject the null hypothesis of no first order and second order which supports the model specification.

The Wald χ^2 has a p-value of 0.000 (see Table 4) which indicates goodness of fit of the model.

4.4. Empirical Results

Table 4 reports the empirical results obtained from the estimated model. It includes the coefficients and standard errors of the explanatory variables considered in the analysis. Only three variables (credit risk, capital risk and liquidity risk) have statistically significant impact on shareholder value.

Table 4: The relationship between shareholder value and risk factors.

Variables	Coef.	Std. Err.	z
SVR _{t-1}	0.21494*	0.121343	1.77
SVR _{t-2}	-0.09868	0.094343	-1.05
CRED _{t-1}	1.591365	1.714125	0.93
CRED _{t-2}	2.378786*	1.405038	1.69
CAP _{t-1}	-1.84734***	0.524886	-3.52
CAP _{t-2}	0.122636	0.432155	0.28
LIQ _{t-1}	-0.32632***	0.120556	-2.71
LIQ _{t-2}	-0.02153	0.103757	-0.21
MARK	-0.00682	0.423274	-0.02
INT	-0.13818	0.106434	-1.3
LN(OP) _{t-1}	0.090139	0.103511	0.87
LN(OP) _{t-2}	-0.07234	0.093846	-0.77
LN(GDPP)	0.134981	0.203455	0.66
LB	-0.2506	0.307405	-0.82
Test	p-value		
Sargan Test	0.2427		
AB test AR(1)	0.1742		
AB test AR(2)	0.1560		
Wald χ^2	0.0000		

The symbols *, **, *** represent significance at 10%, 5%, and 1% respectively

4.4.1. Credit Risk

We find positive relationship between credit risk and shareholder value ratio which is in contrast to the negative relationship found in literature (*e.g.* Berger & De Young, 1997; Altunbas *et al.*, 2000; Anthasoglou *et al.*, 2008; Brissimiss *et al.*, 2008; Zhang *et al.*, 2013). However, this is consistent with results obtained by Fiordelisi & Molyneux (2010a) who also proxied credit risk by

the lags of the ratio of loan loss provision to total loans and also used the shareholder value ratio as a measure of shareholder's value.

The positive relationship comes as a surprise especially the fact that the first lag is insignificant. Nonetheless, if a bank's loan loss provision is commensurate with its total loans, even if borrowers default, loan loss provisions are used to smooth profits and therefore minimize or completely remove the effect of credit risk on shareholder value. Moreover, the focus was not on the immediate effect but the short term effect (first and second lags) hence provisions made today can be used to even out the effect of credit risk in the future. Therefore the higher the provision made for loan losses the higher the positive future impact on shareholder value ratio.

4.4.2. Capital Risk

Capital risk has a negative impact on the value created for shareholders. This conforms to results found in literature (for example Mester, 1996; Altunbas *et al.*, 2000; Brissimiss *et al.*, 2008; Zhang, 2013). At 1% significant level, the first lag of credit risk has a negative influence on the value created for shareholders in the Ghanaian banking industry. The negative impact of capital risk on shareholder value indicates that banks with low capital risk performed better. Banks that are highly capitalized have relatively lower value created for shareholders. The higher the ratio of equity to total asset of banks, the higher its exposure to capital risk and this badly affect value created for equity holders of the bank. The second lag has no significant influence on shareholder value.

4.4.3. Liquidity Risk

Results show that liquidity risk negatively affect bank performance in terms of shareholder value, consistent with literature (*e.g.* Anthasoglou *et al.*, 2008, Brissimiss *et al.*, 2008; Fiordelisi &

Molyneux, 2010a). However, this impact does not appear immediately in the creation of value for shareholders. It has a short term effect on shareholder value since the first lag of liquidity risk was found to be significant at 1%. As a result, banks taking on excessive liquidity risk do not create value for shareholders in the short term. Increase in the proportion of deposits used for loans can adversely affect the performance of banks.

4.4.4. Market Risk

In contrast to previous studies (eg. Fiodelisi & Molyneux, 2010a; Sukcharoensin, 2013; Zhang *et al.*, 2013) that find significant link between bank performance and market risk, we find insignificant result. Market risk exhibits insignificant influence on bank shareholder value in Ghanaian banks. Changes in market conditions such as interest rate, commodity prices, foreign exchange rates *etc.* have no influence on the value creation process of Ghanaian banks. Moreover, fluctuating inflation rates, ever increasing exchange rates and changes in commodity prices such as crude oil in the Ghanaian economy showed no effect on bank performance.

4.4.5. Interest rate risk

As displayed in Table 4, we find no significant impact of interest rate risk on shareholder value ratio. In the value creation process for shareholders, banks' exposure to interest rate risk has insignificant effect. This comes as a surprise since a major concern for banks is their exposure to changes in interest rates. But in the Ghanaian banking environment, there seems to be a huge disparity between the monetary policy rate and banks interest rates. Therefore there is no significant impact of interest rate fluctuations on shareholder value.

4.4.6. Operational risk

Regarding operational risk the model gave no significant effect on shareholder value ratio. Literature focused on operational risk showed a negative impact of operational loss announcement on bank performance and reputation (*e.g.* Cummings *et al.*, 2006; Gillet *et al.*, 2009; Cannas, 2009; Sturm, 2013) however, similar to the findings of Fiordelisi & Molyneux (2010a) we find no significant relationship. The insignificant relationship could mean that banks in Ghana are better managed such that they are exposed to minimal failures in internal processes and in employee proficiency and are better protected from external shocks. Over the period considered, there seems to be no announcement of any operational losses in the Ghanaian banks.

4.4.7. Persistence of Shareholder Value

We find the first lag of shareholder value ratio to be significant which endorses the use of the system generalized method of moments. This is in accordance with the findings of Anthasoglou *et al.* (2008) and Fiordelisi & Molyneux (2010a). The positive relationship also confirms the fact that an increase in the value created for shareholder's lead to access to more funds which goes to increase value created in the subsequent years.

4.4.8. Control Variables

Regarding the control variables used, GDP per Capita has no significant impact on shareholder's value in the Ghanaian banking industry. GDP per Capital has been on the increase over the period considered in this research however, results reflect no impact on shareholder value.

There was also no significant relationship between LB and shareholder value which is in accordance with the finding of Fiordelisi & Molyneux (2010a). Whether a banks is listed or not

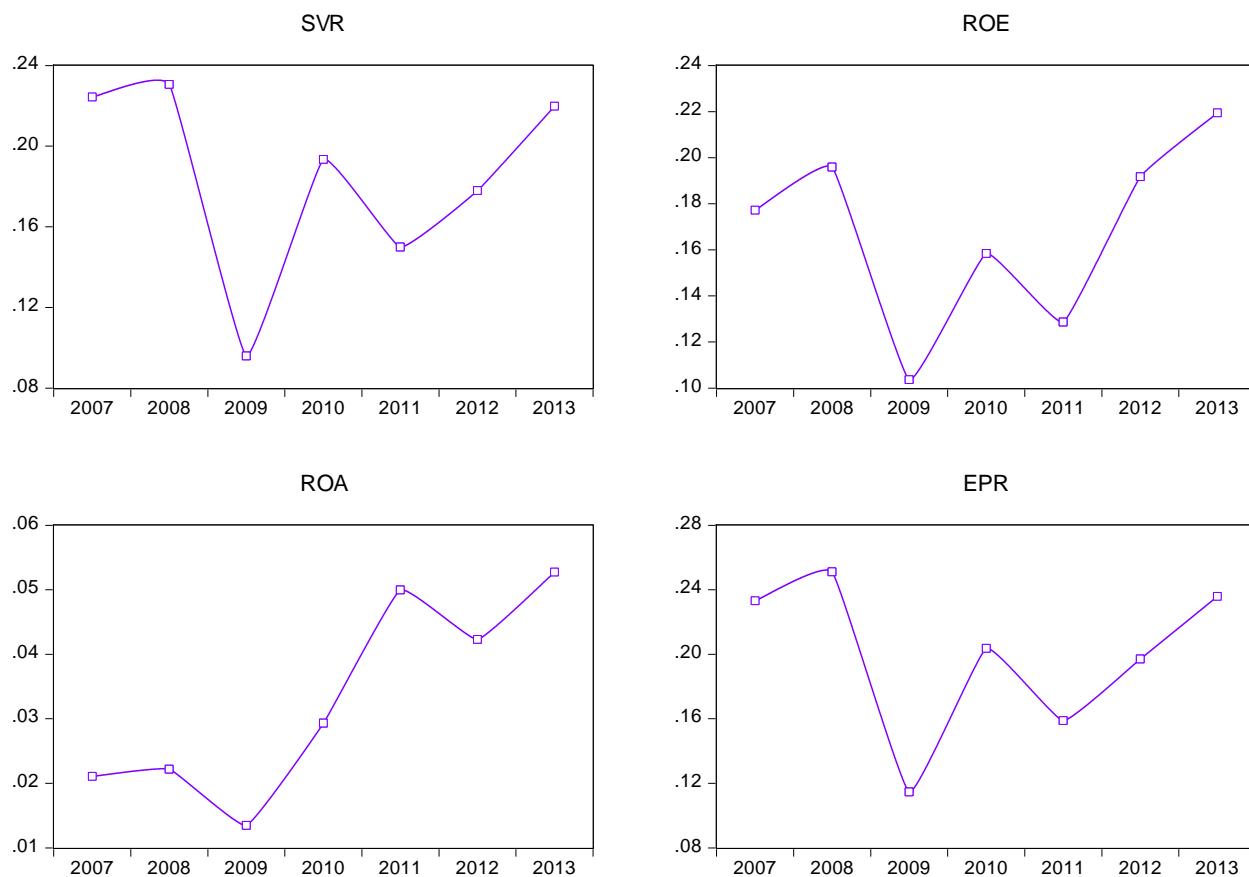
has no influence on shareholder value. This is true in the sense that listed banks on the Ghana Stock Exchange have not yielded substantial returns to stockholders. Moreover returns have been stable and the tradeoff between risk and return does not apply to the Ghana Stock Exchange. Though financial institutions have been encouraged to list on the Exchange, our findings show that doing this would not have any significant positive effect on value created for shareholders.

4.5. Investigating Performance

Figure 2. displays the yearly banking industry performance per the various measures of performance. Performance measured in terms of SVR and EPR declined steadily over the 7 year period. However, the traditional measures of performance (ROE and ROA) show a positive surge in performance with a steep increase in ROA from 2009 to 2010. Nonetheless, we observe that SVR, EPR and ROE follow the same pattern and are highly correlated. The correlation between SVR and ROE is over 97%. This provides evidence that actions directed towards increasing SVR would consequently improve profits (EPR) and return on equity (ROE). Banks should focus on increasing NOPAT and reducing the Cost of Capital Invested.

Industry performance (in terms of SVR and ROE) reached its peak in 2008 and lowest in 2009. Fig. 2 also depicts a steep decline in performance from 2008 to 2009. Interestingly this steep decline in performance occurred when the financial turmoil was subsiding. This result undermines the assertion that the financial turmoil had minimal impact on the performance of Ghanaian banks. It seems the ripple effect of the crisis did not have immediate effect on the banking industry but was felt when it was subsiding.

Fig. 2: Investigating Bank Performance



Our findings show that though shareholder value ratio of banks increased positively from 2011 to 2013, generally there seems to be a decline over the period considered in this research.

4.6. Robustness Tests

In order to validate the findings, three robustness tests were conducted. Firstly, we estimated the model using the traditional generalized method of moments developed by Arellano & Bond (1991). As shown in table 5, our results are consistent with the traditional generalized method of

moments technique except for the effect of the second lag of shareholder value ratio which is significant at 10% significant level.

Table 5: Results from the difference GMM Estimator (Robustness Test 1)

Variables	Coef.	Std. Err.	Z
SVR_{t-1}	0.129113	0.130044	0.99
SVR_{t-2}	-0.06469	0.096276	-0.67
CRED_{t-1}	1.588286	1.648662	0.96
CRED_{t-2}	2.872325**	1.392096	2.06
CAP_{t-1}	-1.68186***	0.506901	-3.32
CAP_{t-2}	0.147128	0.426238	0.35
LIQ_{t-1}	-0.33778**	0.138238	-2.44
LIQ_{t-2}	-0.08289	0.109085	-0.76
MARK	-0.00869	0.403155	-0.02
INT	-0.15362	0.105119	-1.46
LN(OP)_{t-1}	0.135516	0.104509	1.3
LN(OP)_{t-2}	-0.08578	0.090043	-0.95
LN(GDPP)	-0.21209	0.277492	-0.76
LB	0.945008	0.743396	1.27

The symbols *, **, *** represent significance at 10%, 5%, and 1% respectively

Just as we found the second lag of credit risk, the first lags of capital risk and the liquidity risk to be significant in influencing shareholder value ratio when we used the system generalized method of moments, results from the one step generalized method of moments indicate same. This shows that our results are robust.

Secondly, we used EPR and ROE as dependent variables to test the sensitivity of the results obtained to other measures of performance. Table 5 shows the relationship between measures of performance (EPR and ROE) and the risk variables considered in the analysis. When EPR was

used as the dependent variable, we find similar results to SVR though it is not affected by capital risk.

Table 6: Relationship between risk factors and EPR and ROE (Robustness test 2)

Variables	Y=EPR	Y=ROE
Y_{t-1}	0.265941* [0.142339]	0.593146*** [0.134377]
Y_{t-2}	-0.03299 [0.110468]	0.127145 [0.102825]
CRED_{t-1}	2.103 [1.985107]	2.771685*** [0.994026]
CRED_{t-2}	3.211642** [1.580152]	1.504308* [0.826365]
CAP_{t-1}	-0.34195 [0.590373]	-0.25371 [0.272203]
CAP_{t-2}	-0.42885 [0.478952]	0.369106* [0.221365]
LIQ_{t-1}	-0.40103*** [0.144342]	-0.07208* [0.070894]
LIQ_{t-2}	0.005084 [0.123699]	-0.1264 [0.059764]
MARK	-0.25388 [0.479176]	-0.05783 [0.228284]
INT	-0.06951 [0.120509]	-0.03023 [0.054278]
LNOP_{t-1}	0.024935 [0.120536]	0.106803 [0.058599]
LNOP_{t-2}	-0.02297 [0.106979]	-0.06821 [0.047667]
LN(GDPPP)	0.139471 [0.235922]	-0.0449 [0.116865]
LB	-0.25821 [0.316652]	-0.09806 [0.132297]
Sargan Test	0.8453	0.1615
AB(1) Test	0.1142	0.0697
AB(2) Test	0.2114	0.223
Wald χ^2 Test	0.0001	0.0000

The symbols *, **, *** represent significance at 10%, 5%, and 1% respectively

This comes as no surprise since SVR and EVA are highly correlated and the results were expected.

Though most studies find significant positive or negative relationship between profitability (EPR or ROE) and capital risk our results show no significant relationship. EPR is calculated by dividing NOPAT by equity capital which seems to mimic what ROE is. The difference between SVR and EPR is that, the cost of equity capital is subtracted from NOPAT when calculating SVR. Since we find capital risk to be non-persistent it implies that shareholder's funds have surprisingly, no impact on profitability in the Ghanaian banking industry.

Results also depict that our results are not sensitive to ROE. Results are very similar to the results obtained when we used EPR. However, we also find capital risk to have no impact on ROE. This is consistent with the finding when we used EPR as our performance measure. This confirms the fact that EPR and ROE interchangeable. In general, our results are not sensitive to the type of performance measure used.

As a third robustness test, we modified our empirical model. The control variable were excluded from the model since we found them to be insignificant. The results as shown in Table 6 are not different from the benchmark results in Table 4 where we included the control variables. Credit risk has a positive relationship with shareholder value whereas liquidity and capital risk have negative. Shareholder value was also found to be persistent at 1% significant level. Thus in the absence of our control variables our results remain unchanged.

Table 7: Estimates without control variables (Robustness test 3)

Variables	Coef.	Std. Err.
Y_{t-1}	0.2091709*	0.117171
Y_{t-2}	-0.1169645	0.08978
$CRED_{t-1}$	1.416754	1.617663
$CRED_{t-2}$	2.357652*	1.368305
CAP_{t-1}	-1.722686***	0.487457
CAP_{t-2}	0.1964575	0.413707
LIQ_{t-1}	-0.34806***	0.116931
LIQ_{t-2}	-0.0334552	0.099749
MARK	0.0616968	0.409004
INT	-0.1224668	0.100987
$LN(OP)_{t-1}$	0.1130461	0.089199
$LN(OP)_{t-2}$	-0.0615255	0.088041
Sargan Test	0.2345	
AB(1) Test	0.1387	
AB(2) Test	0.1596	
Wald χ^2 Test	0.0000	

The symbols *, **, *** represent significance at 10%, 5%, and 1% respectively

Therefore the empirical results of our benchmark model are consistent and reliable.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1. Introduction

This chapter comments on the findings of this research and gives directions for policy making and further studies.

5.2. Summary and Conclusion

This study investigates the relationship between shareholder value and risk factors of 25 listed and non-listed Ghanaian banks using data spanning the period from 2007 to 2013. A dynamic panel model was used to determine the drivers of shareholder value where shareholder value was calculated focusing on the Economic Value Added. We used the system Generalised Method of Moments estimator to obtain consistent and reliable results.

As expected most of the risk factors considered are statistically significant drivers of shareholder value created and results are consistent with literature. Our main results are as follows;

Regarding the impact of risk factors on shareholder value, results show a negative relationship between credit risk and shareholder value. Since Ghanaian banks have a large portfolio of loans, profits and for that matter shareholder value is enhanced to compensate for the higher level of risk taken. This explains the positive relation of credit risk on shareholder value. Moreover, loan loss provisions are used to smoothen profits.

Secondly, we find a negative relationship between capital risk and shareholders' value. Highly capitalized banks are not creating value for shareholders. Thirdly, we find that in the long run, liquidity has a negative impact on shareholder value created. Empirical results also indicate no significant impact of operational risk, GDP per Capita and LB on bank shareholder value. Whether a bank is listed or not does not have any significant influence on the value creation process of Ghanaian banks. The fact that listed banks are not creating substantial value for shareholders comes as a surprise since banks have been encouraged to go public. Finally we find that market risk and interest risk have no significant impact on shareholder value by Ghanaian banks.

To account for accounting distortions in measuring profits, we made two adjustments to NOPAT and estimated the cost of capital of the banks by employing the CAPM in order to calculate EVA and then divided EVA by the capital invested to obtain the proxy for shareholder value. We find that Shareholder Value Ratio is relatively a better measure of performance and that though traditional measures show a positive growth in performance of Ghanaian banks, shareholder value ratio depicts a decline in performance over the 2007 to 2013 period. At 1% significant level, shareholder value ratio is persistent in the Ghanaian banking industry. Past performance positively influence subsequent performance.

Regarding the relationship between shareholder value and other measures of performance, Shareholder value ratio is highly correlated with EPR, ROE and ROA which indicates that efforts directed to maximizing shareholder value would consequently improve EPR, ROE, and ROA.

To investigate the robustness of the empirical results the sensitivity of our results to other measures of performance were conducted. We find that that estimates were generally not sensitive to the kind of performance measure used and thus results of this research are robust.

This study is significantly different from other studies since it looks mainly at the future effects of current risk exposures on shareholder value of Ghanaian banks. We used the first and second lags of the risk exposures to assess the time it would take to reflect in the value creation process. A major setback is the effect of the information content that is lost when we used the lags of the risk factors. Due to the small sample size, our results are likely to be affected.

5.3. Recommendations

We recommend that Shareholder Value Ratio calculated by dividing Economic Value Added by total Equity Capital should be used as a measure of performance since it is relatively a better measure of bank performance. The SVR depict a decline in performance over the seven year period considered in this analysis whiles ROE and ROA show a steady increase in bank performance. Hence our findings show that banks are not creating much value in terms of value for shareholders. In addition, the accession that the financial turmoil had no or minimal impact on Ghanaian bank needs to be looked at again. Our results show that though it did not have immediate impact on bank performance in 2008 when the turmoil was ending, performance dropped drastically.

The analysis reveals that credit risk has the largest impact on shareholder value and should be on top of the priority list of Ghanaian banks. We recommend that the Credit Bureau should be resourced and equipped to offer sound information on the credibility of borrowers. Banks should also follow the due diligence of credit assessment before lending. To improve performance in terms of value created for shareholders, banks should focus on screening and monitoring credit risk and should be able to predict future levels of credit risk so that provisions commensurate with expected losses can be made. Moreover, BOG should set some standards for calculating loan loss provisions to be adopted by the Ghanaian banking industry.

Moreover, banks should also put in place measures to mitigate liquidity and capital risk since they can have adverse effect on performance.

Further research may address the following issues. First, industry specific, banks specific and macroeconomic drivers of performance could be considered. Moreover, further research can increase the time frame in order not to lose information in the autoregressive process. Since we used the first and second lags of the risk factors that will take some time to impact shareholder value ratio, we recommend that other works should consider a higher sample size. Secondly, issues related to the performance of Ghanaian banks need attention especially those related to the impact of the financial crisis.

Ghanaian banks looking to increase shareholder's value should have a large portfolio of loans since this would in the long run increase shareholder value but the bank should also have in place mechanisms for calculating how much provisions should be made for bad loans.

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