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STOCK MARKET REACTION TO THE RECENT BANKING REFORMS:

EVIDENCE FROM THE GHANA STOCK EXCHANGE

BY

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DECLARATION

I, Korkor Ngobi Azina-Nartey, do hereby declare that this work is the result of my own research and has not been presented by anyone in part or whole for any academic award in this or any other university. All references used in the work have been fully acknowledged.

..... 28/01/2022.....

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CERTIFICATION

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

..... 25/01/2022

PROF. LORD MENSAH DATE

(SUPERVISOR)

..... Jan 28, 2022

PROF. AQQ ABOAGYE DATE

(SUPERVISOR)

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DEDICATION

I dedicate this work to the Almighty God for His grace and favour upon my life. He has blessed me with excellence and never failed me. Also, to my parents, Mr. and Mrs. Azina-Nartey for their encouragement and support in writing this thesis and for solely paying my school fees from crèche to Master's level. I also dedicate this work to my siblings Nee and Naa for their fervent prayers and support during this crucial period of my studies.

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LIST OF ABBREVIATIONS

AR	Abnormal Returns
AAR	Average Abnormal Returns
BoB	Bank of Baroda
BoD	Board of Director
BoG	Bank of Ghana
CAAR	Cumulative Average Abnormal Returns
CAR	Cumulative Abnormal Returns
CBG	Consolidated Bank Ghana Limited
EPS	Earnings per share
FINSAP	Financial Sector Adjustment Program
GSE	Ghana Stock Exchange
GSE CI	GSE Composite Index
GSE FSI	GSE Financial Stock Index
HBG	Heritage Bank Ghana Limited
IFRS	International Financial Reporting Standards
PBG	Premium Bank Ghana Limited
PwC	Pricewaterhouse Coopers
ROE	Return on Equity
SEC	Securities and Exchange Commission
SEO	Seasoned Equity Offerings
UK	United Kingdom
US	United States

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ABSTRACT

This study examines the reaction of the Ghana Stock Exchange to the recent banking reforms and tests the semi-strong form efficiency of the GSE. Daily stock returns of listed companies and market returns consisting of both GSE composite index and GSE financial stock index are analyzed for all listed companies and listed financial institutions respectively. It employs event study methodology and cross-sectional regression. Market model is used in this study. Evidence is found of a reaction in the GSE to the banking reforms. On the event date, which is the announcement of the increase in the minimum capital requirement of banks, positive returns were made by investors. The reason for this reaction could be as a result of high anticipation among the investors that the recapitalization exercise would boost the financial system. This resulted in the demand of shares to rise during this period ensuing in more investors buying shares than selling thereby causing stock prices to rise. Investors who held shares during this period earned positive returns on their investment. The positive impact on share prices could also be attributed to banks issuing shares to raise the extra capital and investors buying those shares thereby giving rise to an increase in the demand of shares triggering share price to increase. Additionally, in the cross-sectional regression, the Market model shows a positive relationship between Cumulative Abnormal Returns and Abnormal Returns for both GSE CI and GSE FSI.

The upward movement of Cumulative Average Abnormal Returns represents investors earning positive returns. The prevalence of significant abnormal returns infers that some investors were able to spot mispriced shares springing from inadequate circulation of information in the stock market and earn abnormal returns by taking either a short position or long position. This should not have been the case in an efficient market which would have limited the occurrence of some investors gaining. In addition to that, some investors made significant abnormal returns even days

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after the event date. Generally, from the results, the Ghana Stock Exchange is found to be inefficient in the semi-strong form.

The study recommends that regulators should be cognizant of the impact of their policies on the stock market in order to improve liquidity in the Ghanaian stock market.

Keywords: *Banking reforms, Bank recapitalization, Semi-strong form market efficiency, Event study, Market model, Cross-sectional regression*

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The financial system in developing countries is highly controlled by banking institutions where loans serve as the basic source of external funding for businesses (Batten et al., 2018). Economic development is enhanced when there is a robust banking system that can sufficiently play its key role in financial intermediation and most importantly safeguarding depositors' funds (Olowe, 2011). A robust banking system can be achieved when banks are sufficiently capitalized which would cause an upsurge in lending, entice more deposits and provide good loan books to be able to absorb deficits that spring from non-performing loans (Homar, 2003; Kukurah et al., 2014).

In recent times, discussions around the sufficient capitalization of banks have heightened due to the international financial crisis that struck the global market (Beccalli et al., 2018). This led to the formulation and implementation of the Basel III which enforces higher capital requirements of banks as a measure to make the banking system more robust and resilient to collapse (Beccalli et al., 2018).

Laeven (2011) and Popoola, Fakunle, Omole and Oyedeji (2018) describe financial crises as an unanticipated canker which affects the liquidity position of banks causing declining output, increasing unemployment, loss of investors' confidence, weakening asset prices, decreasing banks' assets and an overall damage to the economy. Following the global financial crises in 2008, the world economy was rigorously shaken by a major economic decline which affected numerous sectors in the world (Ngwube & Ogbuagu, 2014). These financial crises can be mitigated when

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reforms are formulated and implemented to ensure a more resilient financial system. Waelti (2015) discusses the crisis-begets-reform hypothesis in his article where he mentions that the occurrence of crisis pushes policymakers to execute immediate reforms that were not implemented before the crisis.

The recent reform that was implemented in Ghana by the Bank of Ghana in September 2017 was to increase the minimum capital requirement from GH¢120million to GH¢400million (PwC, 2018). The main objective of this reform was to clean up the banking industry and strengthen the regulatory and supervisory framework to create a more robust banking sector (PwC, 2019). McNamara et al. (2015) concur that recapitalization positively impacts the financial system as it strengthens banks and makes the financial system more robust. Marinova et al. (2014) also mention that increasing capital ratios stabilizes the financial system.

Some studies have been done to examine the impact of recapitalization exercises on stock markets. According to Thalassinos, Pintea and Rațiu (2015), stock markets are seen to be the measurement of any real activity and should reflect price-sensitive news. Olowe (2011) investigated the impact of the 2004 bank recapitalization on the Nigerian stock market and found a positive impact. Beccalli et al. (2018) examined the effects of seasoned equity offerings (SEOs) in relation to bank recapitalization of listed European banks. Unlike Olowe (2011), they found a reduction in profitability, a drop in lending in the short-term which later increased and a rise in the systemic risk of the listed firms.

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This study examines the reaction of the Ghana Stock Exchange to the recent banking reforms using the market model.

1.2 Problem Statement

Banking reform became a topical issue following the introduction of the Basel II and Basel III in 2008 and 2013 respectively which emanated from the global financial crises in 2008 causing international regulators to formulate policies to improve risk management practices and increase the minimum capital needed by banks to operate to ensure a robust financial system (Parise & Shenai, 2018; McNamara et al., 2015; Ngwube & Ogbuagu, 2014).

Ghana has experienced its own share of banking reforms in recent decades. In response to the international financial crisis and other domestic crisis in the financial system, the Bank of Ghana issued the new Capital Requirements Directive (CRD) to banks and specialized deposit taking financial institutions to increase the minimum capital requirement of banks to boost the financial system. Moreover, the Bank of Ghana revoked the license of some universal banks and specialized deposit taking financial institutions to clean up the banking sector. Following the recent banking reforms, focus has been placed on examining possible reasons for the outcome of events (PwC, 2018). Major reasons were found to be poor corporate governance, mismanagement of affairs by management and Board of Directors (BoDs), regulatory and monitoring issues and poor credit administration (PwC, 2018). The banking reforms has led to a 32.35% reduction in the number of banks in Ghana, thus, from 34 to 23. Considering that banks dominate the financial system in developing countries, it is expected that such a significant reform will impact the financial market. Moreover, considering that financial stocks are the most liquid stocks on the exchange in

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developing countries like Ghana, any reform in the banking sector is expected to have an effect on the performance of the stock exchange.

Figure 1.1 and Figure 1.2 show the GSE composite index and GSE financial stock index respectively from 2015 to 2019. The announcement date for the increase in the minimum capital requirement by Bank of Ghana was on 11th September 2017. The GSE composite index was increasing and attained its maximum in December 2017 and thereafter started declining. Further, Figure 1.2, some months to that period, the GSE FSI was gradually increasing from 2017 and attained its maximum level in April 2018 of an index of 3,200.80 and later started declining thereafter to 1,788.79 in November 2019. This may be as a result of other factors or could be as a result of the recent banking reforms. This research, therefore, seeks to establish whether the recent banking reform is the reason for these fluctuations.

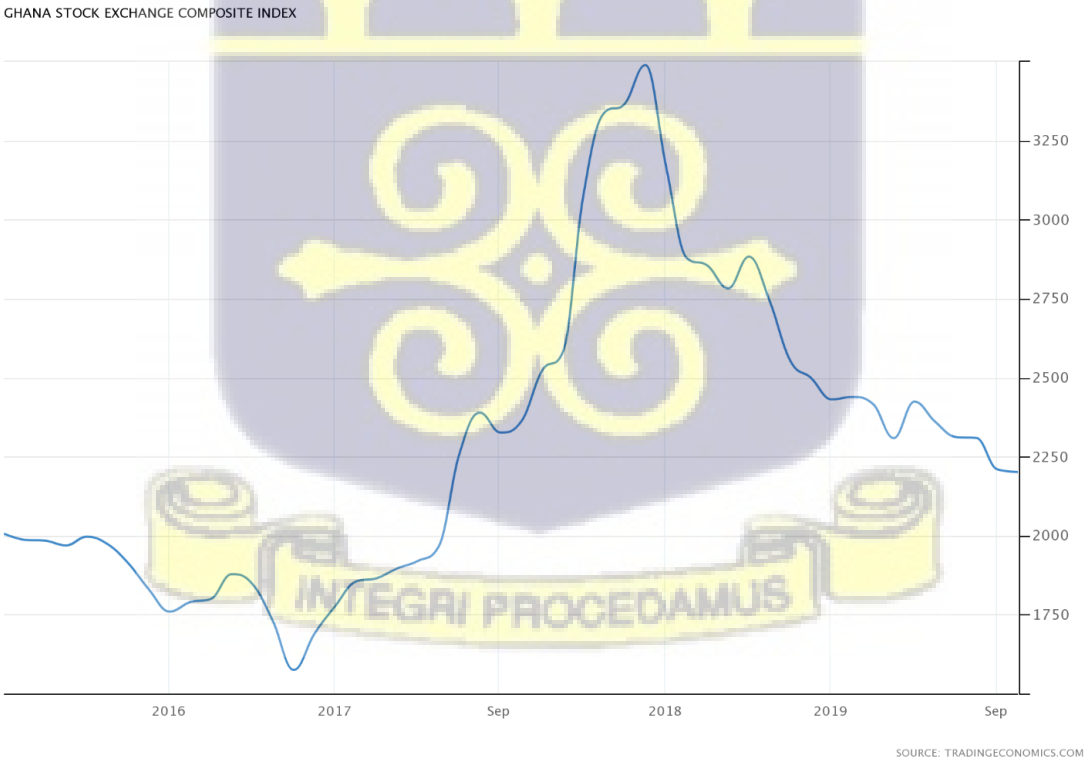

Figure 1.1 GSE Composite Index 2015 to 2019

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Figure 1.2 GSE Financial Index 2015 to 2019

Thalassinos et al. (2015) argue that financial crises are expected to reflect on stock markets as they are seen to be the measurement of any real activity. Notwithstanding, to the best of the author's knowledge there is no such empirical studies on the reaction of the Ghana Stock Exchange (GSE) to the banking reforms. From 1976 to 1983, the Ghanaian economy was soaked in severe crises that distressed the financial sector leading to a banking crisis in Ghana which resulted in the formation of a financial sector reform programme in the last quarter of 1987 (Addison & Antwi-Asare, 2000). As part of the programme, one of the action steps was to form a capital market. The Ghana Stock Exchange was established in 1989 (Addison & Antwi-Asare, 2000). This implies that GSE was not in existence during this crisis, making it impossible to have seen the effect of the reforms on the Ghanaian stock market. This study is therefore relevant now as the GSE has developed over the years.

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Investors' confidence is adversely affected when the level of market uncertainty increases causing investors to pull their funds from financial institutions (Morales & Andreosso-O'Callaghan, 2018). The 2019 Ghana Banking Survey by PwC revealed that following the banking reforms, deposits reduced by 17%. A number of bank executives (45%) believe that the reforms have impacted their businesses negatively which is displayed in decreasing deposits and some panic withdrawals (PwC, 2019). A reduction in deposits decreases the funds financial institutions can give out as loans. This implies that they will not have much revenue in terms of interest on loans as loans given out have reduced. This will result in decreased net interest which feed into the profitability of banks and this has a ripple effect on their earnings per share which appears on the stock market and is also controlled by demand and supply forces. Investors receive a signal effect that the firm may not be profitable, when stock prices are falling. In addition to that, investors become more risk-averse when they lose confidence in the financial system and would not want to commit to long term investments in the form of shares but would prefer fixed deposits. On the other hand, if investors on the stock market perceive the news of recapitalization to be a good one which would strengthen the banking system, this would elicit a response by investors to buy shares in banks that are issuing out shares to be able to meet the increased capital. As the demand for shares increases, it causes the price of shares to shoot up. This leads to investors who owned shares prior to the recapitalization exercise to earn some returns on their investment. From the above, there is a likelihood of a positive or negative response from investors depending on how they perceive the news of recapitalization of banks.

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Some empirical studies have examined the stock market reaction to events in both developed and developing markets (Gangadharan, Srinivasa Rao & Yoonus, 2012; Ijeoma, 2017; Majapa &

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Gossel, 2016; Ngwube & Ogbuagu, 2014; Edmans, García, & Norli, 2007; Larson & Madura, 2003; Rau & Kadiyala, 2004; Olowe; 2011). However, there is sparse research on reaction to banking reforms in the GSE. A study on the reaction of the Ghana stock market to the banking reforms is important because it houses the shares of numerous investors (individuals & institutions, local or foreign) in Ghana and serves as a basis for some investment portfolios. It is necessary to examine the impact on the stock market to enable regulators put in place measures that will make the Ghana stock market robust and also to be cognizant on the impact of such financial reforms to protect investors on the stock market. Again, it is crucial to examine the reaction of the GSE to the recent banking reforms due to the dominance of the listed financial firms on the exchange and the provision of liquidity by these financial firms. Unlike other studies conducted on efficiency of the stock market which consider all the firms listed on the stock exchange (Olowe, 2011; Boubaker et al., 2015; Ma et al., 2019; Piccoli et al., 2017) and determines the impact, this study examines both the reaction of the GSE composite index (all listed companies) to the banking reforms as well as the financial segregation of the stock market by examining the reaction of the GSE financial stock index (all listed financial institutions) to the banking reforms.

1.3 Research Objectives

The core objective of the study is to examine the reaction of the Ghana Stock Exchange to the recent banking reforms. Specifically, the study seeks:

- To examine the reaction of the GSE composite index (all listed companies) to the banking reforms
- To examine the reaction of the GSE financial index (all listed financial institutions) to the banking reforms

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1.4 Research Questions

To be able to achieve the above objectives, this research is guided by the following questions:

- What is the rate of reaction of the GSE to the banking reforms?
- Were there drastic movements in stock prices over the study period?
- Did investors on the GSE earn or lose on their shares over the study period?

1.5 Significance of the Study

This research is significant to policy-makers, practitioners and future researchers. It serves as a reference work and a source of information for researchers who wish to research into stock market reactions to various events in Ghana and Sub-Saharan Africa. Areas to be explored in future research are proposed in the final chapter.

Also, this research informs directors and managers to better position themselves to withstand external factors that may affect their financial performance in order to have a more long-run focus and put more implementable measures in place to tackle similar issues.

Furthermore, this research is relevant to policymakers in Ghana - Securities and Exchange Commission (SEC) and Bank of Ghana (BoG). It informs regulators of the effect their regulations have on the stock market and various industries in the financial sector in order to consider these factors when making decisions. It also provides evidence of stock market imperfection or otherwise. This will inform SEC and BoG to put in controls to overcome market imperfections in order to boost market efficiency and enhance market liquidity in Ghana.

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The contribution of this study shows how the stock market reacts to the banking reforms in order to enable regulators put in place measures that will make the Ghana stock market robust and also to be cognizant of the impact of such financial reforms on the stock market in order to protect investors.

1.6 Scope of the Study

This study examines the reaction of the stock market to the recent banking reforms using evidence from the Ghana Stock Exchange (GSE). The research excludes listed preference shares and Ghana Alternative Market (GAX) shares.

1.7 Organization of the Study

The outline of the study is as follows: Chapter two reviews the theoretical and empirical findings on the stock market reaction to banking reforms and narrows it down to Africa to put the study in the right context and perspective. Chapter three states the sources of data, methods of collecting data and the approach used in analyzing the data. Chapter four provides a presentation and discussion of the findings of the study. The final chapter, Chapter five presents the summary, conclusions and recommendations of this study.

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CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This second chapter presents an in-depth discussion of the relevant studies on banking reforms and the reaction of stock markets to this news. The sections of this chapter entail two main parts. The first part reviews the theories underpinning banking reforms and stock market reaction and the second part analyses some empirical evidence of the issue discussed. At the end of the chapter are the gaps identified in recent literature which is the basis for this study.

2.2 Overview of Banking Reforms and Ghana Stock Exchange

The financial sector is highly regulated and supervised as it plays a substantial role in influencing other sectors of the economy (Doumpos et al., 2015; Parise & Shenai, 2018). Over the last three decades, many banking and financial sector reform programs have been implemented in several nations to serve as an ombudsman over this sector (Doumpos et al., 2015; Shaikh et al., 2017). Reforms are formulated and implemented by policymakers to prevent the reoccurrence of crisis or to curb its likely occurrence where controls may not have been already established (Waelti, 2015). Andersson (2016) argues that banking crises are caused by weak political and economic institutions. Rajan (2010) and Wilmarth (2010) on the other hand debated that extreme risk-taking by financial institutions is a major cause of financial crises. Waelti (2015), however, purports that the cause of crises is usually well-known with the issue rather being identifying the origin of the crises.

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According to Parise and Shenai (2018), new reform programs sprang up as a response to financial crises such as Banking Reform Act 2013 in the United Kingdom (U.K.), Basel III and Dodd-Frank Act in the United States (U.S.). The Banking Reform Act 2013 was established as the primary regulatory response to the financial crises in the U.K. The Basel Committee II, however, formulated to improve risk management practices in the behaviours of banks where banks can only hold less risky portfolios (Zhang et al., 2008). Basel III, a new regulatory framework, requires banks to hold more capital and higher quality capital as compared to the framework under Basel II (Parise & Shenai, 2018). According to McNamara et al. (2015), Basel III upsurges the robustness of bank management.

In summary, the occurrence of crisis pushes policymakers to execute immediate reforms that were not implemented before the crisis or to prevent the occurrence of the crises in the first place (Waelti, 2015).

Some financial reforms in Ghana since its independence and how reforms have resolved financial and economic crises or otherwise over the years are outlined below:

According to Addison and Antwi-Asare (2000), the financial sector and macro-economic policies that were executed after Ghana's independence is the genesis of the financial crisis in Ghana which was heightened in the late 1970s due to a sudden drop in economic performance. In the government's desire to rapidly industrialize the nation after Ghana's independence, it interfered greatly in the activities of the financial sector causing financial repression (Addison & Antwi-Asare, 2000; Owusu-Antwi, 2011). They mentioned that the main sources of funding for this industrialization process were mainly from banks which included huge reserve requirements and

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hefty taxation and this caused key twists in the financial sector. This resulted in the formulation of the Economic Recovery Programme (ERP) in 1983 to cause a balance in the economy and most importantly increase growth (Addison & Antwi-Asare, 2000). As a financial liberalization measure, the Financial Sector Adjustment Program (FINSAP) was also established in 1989 as Ghana's strategy for economic growth (Owusu-Antwi, 2011). According to Owusu-Antwi (2011), unlike the financial repression which brought about the extreme financial crisis in Ghana after independence, financial liberalization has significantly impacted on Ghana's economy which includes the development of capital and money markets. The FINSAP comprised three main areas namely; restructuring of banks, reforming the prudential system and the liberalization of financial markets (Owusu-Antwi, 2011). These areas mainly involve banks because banks dominate the financial system in Ghana (Addison & Antwi-Asare, 2000).

The Ghana Stock Exchange (GSE) was founded as a private company limited by guarantee under the Companies Code of 1963 in July 1989. It was later converted to a public company limited by guarantee in April 1994 and commenced operations on November 12, 1990, with 12 listed companies (equities) and one government bond with a market capitalization of 30 billion cedis in 1991 (Addison & Antwi-Asare, 2000; Owusu-Antwi, 2011). Addison and Antwi-Asare (2000) and Owusu-Antwi (2011) stated that during the first two years after its establishment, the market capitalization of the GSE rose to 43 billion cedis with an increased number of listed companies of 15. The total market capitalization further rose to 95 billion cedis in 1993 with total capital gains of 123%. According to Owusu-Antwi (2011), the GSE raised about 140 billion cedis and US$4.8 million with the number of listed companies being 21, during the initial years of its operations,

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through equities and bonds. This was to allow for diversification and generate returns for investors (Owusu-Antwi, 2011).

The companies listed on the GSE comprise manufacturing, banking, mining, oil, brewery and telecommunication industries. Two indices are published by the GSE which include the GSE Composite Index (GSE-CI) and the GSE Financial Stocks Index (GSE-FSI) beginning from 4th January 2011. While the GSE Composite Index (GSE-CI) is computed based on the volume-weighted average closing price of all listed stocks, the GSE Financial Stocks Index (GSE-FSI) constitutes only listed stocks from the financial sector thus banking and insurance sector stocks. Both the GSE-CI and GSE-FSI have a base index value of 1000 whose base date is December 31, 2010.

According to Owusu-Antwi (2011), the capital markets in Ghana are not advanced causing banks to dominate the financial system. Bawumia et al. (2008) also sided with him in their study that Ghana's capital market is illiquid and underdeveloped with little investor participation. Aveh and Awunyo-Vitor (2017), however, states that upon the adoption of IFRS in 2007, the market will be more efficient.

2.3 Bank recapitalization and its implications

In response to the international financial crisis, Basel III enforces higher capital requirements of banks as a measure to make the banking system more robust and resilient to collapse (Beccalli et al., 2018). Marinova et al. (2014) concur that increasing capital ratios stabilize the financial system.

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Low returns on assets and bad loans which lead to an impairment of capital make it crucial to increase the minimum capital requirement of banks (Odonkor et al., 2011).

To be effective, recapitalization should be large enough to cause an upsurge in lending, entice more deposits and have good loan books (Homar, 2003). Kukurah et al. (2014) also mention that this exercise gives banks the capacity to absorb deficits that spring from non-performing loans owing to a strong capital base. Adegbaju and Olokoyo (2008) however mention that although recapitalization is relevant for a more robust economy, banks should ensure that they legitimately provide this capital. Sani et al. (2012) state that financial institutions should not see it as a way to collapse banks but to increase public confidence in the financial system.

Bank of Ghana has over the years increased the capital requirements of banks. Per the Banking Law 1989 (PNDCL 225), the first capital requirement was fixed at a minimum capital requirement of the cedi equivalent at that time of $740,700. In the year 2004, as per the introduction of the Banking Act 2004, Act 673, all universal banks were expected to have a minimum capital requirement of GH¢7million to strengthen the capital base of banks. The minimum capital requirement was further increased in 2008 from GH¢7million to GH¢60million as there was an expected growth in the economy as a result of the oil production in Ghana to make the banking industry more robust for this higher level of risk (Kukurah et al., 2014). In 2012, the minimum capital requirement was increased to GH¢120 million and in September 2017, Bank of Ghana embarked on a restructuring exercise to improve governance of the financial institutions and introduced new strategies concerning capital (Basel II & III), Corporate Governance and an

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appropriate requirement for board members of banks (PwC, 2018). This exercise led to an increase in the minimum capital requirement of banks by over 233% thus from GH¢120 million to GH¢400 million. The Basel II Committee requires financial institutions to preserve sufficient cash reserves to enable them to absorb deficits that may arise through their operations causing the minimum Capital Adequacy Ratio (CAR) to be set at 13% (PwC, 2019).

Recapitalization has a positive impact on the financial system as it strengthens banks and makes the financial system more robust (McNamara et al., 2015). The issue, however, is that it is more difficult for local banks to meet these requirements than the foreign banks in Ghana (PwC, 2018). Ojeka et al. (2015) also state that recapitalization exercise causes loss of jobs as banks would have to cut costs to be able to meet the requirements of the Central Bank.

Bank recapitalization can lead to bank consolidation to meet the increased minimum capital requirement (Soedarmono et al., 2013; Yalley et al., 2018). Upon the increase in the minimum capital requirement of Ghanaian banks in 2012 to GH¢120 million, certain banks could not achieve this leaving mergers and acquisitions as their last resort to be able to conform to the regulations of the Central Bank (Barnor & Adu-Twumwaah, 2015). The mergers and acquisitions of some banks included Access Bank and Intercontinental Bank, Ecobank Ghana and The Trust Bank of Ghana and UT Bank and BPI (Barnor & Adu-Twumwaah, 2015).

Again in the year 2018, when the minimum capital requirement was increased from GH¢120 million to GH¢400 million to ensure the robustness of the financial system, eleven (11) banks in

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Ghana could not meet this requirement and this led to the seizure of their licenses by BoG (PwC, 2019). Construction Bank, Beige Bank, Royal Bank, uniBank and Sovereign Bank were consolidated to form Consolidated Bank Ghana Limited on 1st August 2018. Premium Bank Ghana Limited ("PBG") and Heritage Bank Ghana Limited ("HBG) who had their licenses revoked on 4 January 2019 were also taken over by Consolidated Bank Ghana Limited (CBG). Bank of Baroda (BoB) exited the market on its free will, BoG approved three mergers of six banks namely First National Bank and GHL Bank, Energy Bank and First Atlantic Bank, and Sahel - Sahara Bank & Omni Bank (PwC, 2019). Liquidity and insolvency issues, poor Corporate Governance, falsification of capital and mismanagement of funds were some of the reasons given by Bank of Ghana for these mergers (PwC, 2019).

Over the past years since Ghana's independence, the recent banking reforms led to many banks being merged, acquired or shut down as compared to previous years causing the number of banks to reduce from 34 to 23 (PwC, 2018) which has been the largest drop in the number of banks so far which makes it crucial to examine the effect of this recent banking reforms on Ghana's stock market.

2.4 Theoretical Review

The theories underpinning this research are discussed in five (5) sections. These sections chronologically analyze a plethora of literature across the world and thereafter are narrowed down to developing countries and then to Ghana. These sections include the following:

2.4.1 Efficient Market Hypothesis

2.4.2 Random Walk Theory

2.4.3 Behavioural Finance

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2.4.1 Efficient Market Hypothesis

This section reviews market efficiency in stock markets. This would lay the foundation and direction of this study which aims to examine the reaction of the stock market to the banking reforms.

Market efficiency explains how accurately security prices reflect available information and the response to new information immediately it is announced (Brealey et al., 2015). Brealey et al., (2015) discusses the three forms of market efficiency by stating that when prices reflect all acquirable information, it is a strong-form efficient market; when prices reflect all publicly available information, the market is semi-strong form and when prices reflect all the information in past prices, the market is described as weak form.

In an efficient market, stocks are fairly priced and returns are unpredictable due to the symmetry of information and awareness of all investors of the current trends (Brealey et al., 2015). For weak-form efficient markets, investors cannot earn abnormal profits from studying past information. Likewise with semi-strong form efficient markets, investors are not able to earn abnormal returns from public information and announcements because information is shared instantaneously and is unbiased. Similarly, for strong form efficient markets where prices reflect all the information available in the firm and the economy, it is not possible for investors to repeatedly earn supernormal returns on their investment. This is because in these three forms of market efficiency, information is expected to be widely spread and investors are expected to react instantaneously to all price-sensitive information making it impossible for one or a few investors to earn abnormal

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returns. Brealey et al. (2015) state that markets in which investors continuously earn on their investment are deemed to be inefficient markets in the strong form, semi-strong form or weak-strong form.

Robinson and Bangwayo-Skeete (2017) argue that unlike a relatively efficient market that quickly reacts to news, a relatively inefficient market either underreacts (reacts slowly) or overreacts (reacts too quickly) to the news. According to Zahera and Bansal (2018), the inconsistencies in the financial market is as a result of many investors whose behavioural and psychological make-up influence their investment decisions which is known as behavioural finance. Unlike the efficient market perspective, it shows the behaviour of investors in making financial decisions (Kumar & Goyal, 2015). This is a deviation from the rules of Efficient Market Hypothesis (EMH) which is known as anomalies (Latif et al., 2011).

Analysis of literature reveals that developed markets empirically found to be more efficient than emergent markets (Mobarek, 2000; Robinson, 2005). However, what is the extent of this efficiency? This is because early studies show overreaction, underreaction or unpredictability of advanced markets (Cootner, 1962; Fama, 1965; Kendall & Stuart, 1943; Osborne, 1962; Working, 1934). This would mean that the efficiency of both developed and developing markets could be random. However, the response to news announcement by most African stock exchange markets is rather slow (Massele et al., 2013). Massele, Darroux, Jonathan and Fengju (2013) mentioned that most African stock exchange markets are illiquid and thin. This implies that the exchange of shares is too low and the reason for this partly being lack of active market participants who do not

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trade actively. Shares are held for long while waiting for prices to appreciate before sales are made and capital gains are earned (Massele et al., 2013). The issue may, therefore, be that market participants in developing markets may not be active.

2.4.2 Random Walk Theory

Random-walk theory posits that movement of stock prices are not dependent on previous price movement thus they are not responsive to past prices. This theory implies that investors cannot determine future prices based on the historical path of prices as it does not provide useful information about the future (Brealey et al., 2015).

Earnings forecasts, chart patterns, investment advisory services, fundamental and technical analysis cannot be used to predict movement of stock prices (Malkiel, 2012). Most researches liken the movement of stock prices using the Random Walk Theory to a drunk man whose next steps are unknown, unpredictable and independent of past history.

According to Brealey et al. (2015), in competitive markets, it is essential that prices follow a random walk. This is because if future prices could be projected from past prices, investors would earn abnormal profits. However, in competitive markets as investors are well informed and would respond in a similar way, prices will quickly adjust as participants attempt to seize the opportunity to make some returns. When this occurs, abnormal profits will gradually reduce until they no longer exist. Investors would therefore see no need to respond according to the pattern of past prices but would follow a random walk.

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Random walk may be classified as one of the anomalies in market efficiency as investors do not react in tune with previous price movement hence its name “random walk”. Other anomalies that exist in the market include the calendar anomaly, January impact, days of the week, small companies exceed, low value, neglected stocks, reversals, dogs of the market, market to book equity ratio, P/E impact, over and under reaction to earnings and momentum effect (Sharma, 2014).

2.4.3 Behavioural Finance

According to Zahera and Bansal (2018), the inconsistencies in the financial market is as a result of many investors whose behavioural and psychological make-up influence their investment decisions which is known as behavioural finance. Unlike the efficient market perspective, it reflects the behaviour of investors in making financial decisions (Kumar & Goyal, 2015).

Investors operating using this theory merge both psychology and finance in making investment decisions. According to Brealey et al. (2015), investors may overreact or underreact to new information based on some cognitive and behavioural reasoning guiding their decisions. Behavioural finance posits that the stock market is not efficient. Ross et al. (2010) argue that investors are irrational, reactions based on their level of rationalization are parallel across many investors and abnormal returns resulting from the irrational behaviour of investors cause the prevalence of market inefficiency.

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This irrational behavioural stems from the attitude of investors to risk and how investors evaluate probabilities (Brealey et al, 2015). According to Brealey et al. (2015), the attitude of investors is reflected in the fact that generally, psychologists have observed that people are averse to making losses. They further mention that this is mainly dependent on whether the investor was previously making gains or losses. For investors who were previously making losses, they would be reluctant to not make losses in their next investment. On the other hand, investors who previously earned unanticipated abnormal profits would not mind entering into a risky investment.

In addition to the attitude of investors to risk, Brealey et al. (2015) also mention that irrational behaviour can also be exuded based on how investors evaluate probabilities. Generally, investors depend on a few recent happenings in making their investment decisions. They tend to lay emphasis on how well the market performed in the most recent happening and turn a blind eye to the current situation (Brealey et al. 2015). Also, some investors are extremely conservative and react slowly in revising their investment decision upon the appearance of new information. Others are also overconfident in their ability to make gains instead of losses and underrate the possibility of the non-occurrence of their projections (Brealey et al. 2015).

2.5 Empirical Review

In this section, several empirical evidences on the reaction of stock markets to banking reforms are discussed. This section shows the various findings in this issue and helps to identify gaps that this study will address.

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2.5.1 Banking reforms and Stock market reaction

This section addresses some empirical findings on the reaction of the stock markets to banking reforms in terms of bank recapitalization.

Olowe (2011) in an article investigated the impact of the announcement of the 2004 bank recapitalization on the Nigerian stock market. His study employed event study methodology over the period January 1986 to December 2006 using monthly data. From his study, he found that the announcement of the 2004 bank recapitalization showed a positive impact in the Nigerian stock market. Investors in the listed companies made positive abnormal returns from this announcement. Furthermore, his study found the Nigerian stock market to be inefficient in the semi-strong form.

Obuobi et al. (2020) in an article examined the effects of recapitalization on the Ghanaian banking sector using a period of ten (10) years spanning from 2007 to 2017 which includes three (3) bank recapitalization exercises (2007, 2012 and 2017) using the 2012 exercise as the benchmark. Quantitative research technique was adopted in their study using secondary data over the period 2007 to 2018. Based on their study, they found that bank recapitalization has the tendency to boost the performance of banks and advised the Bank of Ghana to implement adequate policies that would be beneficial not only to depositors but the entire nation.

Beccalli et al. (2018) on the other hand, examined the effects of seasoned equity offerings (SEOs) in relation to bank recapitalization of listed European banks over the period 2002 to 2014 adopting propensity score matching. Unlike Obuobi et al. (2020), they found a reduction in profitability, a drop in short-term lending which later increased and a rise in systemic risk. They recommended

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that regulators should fully consider the adverse effects that strict Basel III capital requirements have on them. They also mentioned that the reason for recapitalizations determines the effects of SEOs.

Marinova et al. (2014) performed a research to examine the effect of bank recapitalization through the issuance of equity and the private costs associated with it in the EU and US on bank value using event study methodology over an event period spanning from 2007 to 2013. From their study, they found that seasoned equity offerings (SEOs) have a significant and negative impact on bank stock prices.

The recent banking reforms as a result of the recapitalization exercise led to a reduction in the number of banks from 34 to 23. Investors' confidence reduced which resulted in decreased deposits and some panic withdrawals (PwC, 2019). This has necessitated this study to examine whether this impact was seen on the GSE. Although Obuobi et al. (2020) investigated the impact of recapitalization on the Ghanaian banks, their study does not show the impact on the GSE. Also, Olowe (2011) only made use of abnormal returns. This study seeks to include control variables to establish how other macro-economic factors can affect the results. Furthermore, based on previous studies, Olowe (2011), Beccalli et al. (2018) and Marinova et al. (2014), to analyze the effect of the recapitalization of banks on stock markets in terms of reaction and seasonal equity offerings, inconclusive results were found. This study, therefore, examines the reaction of the stock market to the banking reforms in the Ghanaian stock market.

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2.6 Research Gaps

This research will be addressing certain gaps in other literature. Unlike other studies on efficiency of the stock market which consider all the firms listed on the stock exchange (Olowe, 2011; Boubaker et al., 2015; Ma et al., 2019; Piccoli et al., 2017) and determines the impact, this study examines the reaction of the GSE composite index (all listed companies) to the banking reforms as well as the financial segregation of the stock market by examining the reaction of the GSE financial stock index (all listed financial institutions) to the banking reforms using the market model.

Furthermore, current studies have comprehensively examined the stock market reaction to events in both developed and developing markets (Gangadharan, Srinivasa Rao & Yoonus, 2012; Ijeoma, 2017; Majapa & Gossel, 2016; Ngwube & Ogbuagu, 2014; Edmans, García, & Norli, 2007; Larson & Madura, 2003; Rau & Kadiyala, 2004). Very little research has been done on reaction to banking reforms in the GSE. It is therefore crucial to examine the reaction of the GSE to the recent banking reforms due to the dominance of the listed financial firms on the exchange and the provision of liquidity by these financial firms.

2.7 Literature Summary

This chapter reviewed both theoretical and empirical literature by taking into consideration a general overview of banking reforms in both developed and developing countries. It further discussed the causes and effects on reforms in economies and goes ahead to give an overview of the Ghana Stock Exchange and the reason for its establishment as well as theories on market

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efficiency and reviews empirical literature in different markets. This study, hence, seeks to examine the reaction of the GSE to the recent banking reforms.

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CHAPTER THREE

METHODOLOGY

3.1 Introduction

Chapter three discusses the sources of data, methods of collecting data and the econometric model used in analyzing the data. It further discusses the strategy, key variables and metrics encapsulated in this study. This helps to provide this study with a basis for analyzing systematically and scientifically to come out with accurate results.

3.2 Research Approach and Data Sources

This study adopts the quantitative approach and relies on secondary data sources. To examine the reaction of the GSE to the recent reforms, daily returns of listed companies and market returns consisting of both GSE composite index and GSE financial stock index are analyzed for all listed companies and listed financial institutions respectively. Information about the ownership structure of the firm is collected from the annual reports of the listed companies. Data on the market capitalization of all listed firms were extracted from the Annual Reports Ghana website. This study samples data of 38 listed companies in 2017 which encompasses the study period to examine the reaction before, during and after the event period. It also includes an estimation period. The estimation window is a control period and precedes the event period as seen in this study in order not to influence the model parameters. To estimate the abnormal returns throughout the test period, this study employs the event study methodology and follows the methodology of Cox and Peterson (1994) and Bremer and Sweeney (1991). This study uses the Market Model to measure the abnormal returns.

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3.3 Frequency of Stock Returns, Event Window and Event Dates

In event study, the frequency of the return is dependent on the duration of the event periods and accessibility of data (Sitthipongpanich, 2011). Most recent event studies use daily returns as compared to monthly returns (Khotari & Warner, 2006). Daily returns are used for short-term event studies while monthly returns are used for long term event studies (Sitthipongpanich, 2011).

Khotari and Warner (2006) also mentioned that short-term tests are more specific and robust as compared to long-term tests which could absorb other events that are not the focus due to the length of the study period. They further stated that short-term tests are the best proof of efficiency. This would imply that inefficient markets may not use this test. Khotari and Warner (2006), however, stated that with both short and long-term tests, the framework used must state the basis for measuring and comparing the performance of event study methods to give reliability to the study.

This study uses daily stock returns from the GSE to ascertain the reaction of the stock market to the recent banking reforms. Daily returns are used because they are more specific and robust and are the best proof of efficiency. This research, therefore, seeks to examine whether the GSE reacted to the recent reforms using the daily returns of the listed companies during the sample period.

3.3.1 Estimation period and event period

The event date in this study is 11th September 2017 on which the Bank of Ghana announced the increment in the minimum capital requirement from GHS120million to GHS400million. This

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study examines how the Ghanaian stock market responded to this news. The estimation period used in this study which is the control period that precedes the event period in order not to influence the model parameters. This period was chosen not only because it precedes the event date since other earlier periods could have preceded it, but also because it was the closest to the start of the event period. The event period is from 5 days before the event date to 5 days after the event thus from 4th September to 18th September 2017.

The objectives of this study are to examine the reaction of all listed companies to the banking reforms on the GSE using the GSE Composite Index and the reaction of all listed financial institutions to the banking reforms on the GSE using the GSE Financial Stock Index. The GSE Composite Index addresses how all firms responded to the news. This is because all listed companies keep their money in banks. This would imply that an instability in the banking sector affects other companies. A typical example is Unilever Ghana (a listed manufacturing company in Ghana) which stated that the reforms caused low sales of consumer goods as well as "unusually high inventory levels" from its distributors (Larnyoh, 2019). The GSE Financial Stock Index which includes financial institutions would be used to examine the impact on a more direct sector to the study at hand.

3.4 Event Study Methodology

Event study methodology is employed in examining the reaction of the stock market to an event (Bodie et al., 2014). During a particular period, several events and indicators can be the reason for the movement in stock prices. However, event study distinguishes a particular event from all other events by computing the abnormal (excess) returns during that particular period which shows the

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market reaction to the intended event (Sitthipongpanich, 2011). Several studies have used event study methodology in examining the effect of events on stock markets (Boubaker et al., 2015; Bremer & Sweeney, 1991; Cox & Peterson, 1994; Ma et al., 2019; Piccoli et al., 2017). Results from these studies either showed a positive or negative impact on the stock markets and how quickly (overreaction), slowly (underreaction) or no reaction on the stock markets to the various events studied as well as how significant the reaction is.

This methodology begins by first computing the returns R_t of the listed companies to be studied. The return variable R_t is defined as the change in the natural logarithm of the closing price over two consecutive trading periods:

$$R_t = Log\ P_t - Log\ P_{t-1} \quad (1)$$

where P_t is the current closing price of the stock in period t and P_{t-1} is the previous closing price.

Event study methodology further computes the market returns using the same formula to establish the real effect on the market and estimate returns that exceed what the market is making. The difference between the stock's actual return and this benchmark (market returns) is referred to as the abnormal return.

This study uses the market model which is generally applied when testing event studies and market efficiency (Bhagat & Romano, 2001; Brenner, 1979; Duso et al., 2010; Hajek & Jindrova, 2007; Higgins & Rodriguez, 2006). Other models include the arbitrage pricing model, mean-adjusted returns model and capital asset pricing model (CAPM). Arbitrage Pricing Model incorporates macro-economic variables which are available in quarterly and monthly forms. Interpolation

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stretches the data and distorts the results and can be applied when using monthly and quarterly data. The market model is employed in this study to test for both semi-strong market efficiency and stock market reaction to the recent banking reforms.

3.4.1 Market Model

Using the market model, the stock's abnormal return is calculated as the difference between the firm's return and the market index. The abnormal returns measure the investors' skill for a firm because the investor was able to beat the market thus exceeding the benchmark. This shows that investors reacted to news that they deemed to be price sensitive.

The stock return is given by:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \quad (2)$$

The firm i and market m returns for day t are denoted as R_{it} and R_{mt} respectively. The OLS estimates of the market model parameters are α_i and β_i for firm (i) estimated over the estimation window which is the period before the event period in order not to influence the model parameters.

The abnormal returns (AR_{it}) of the stock are the residuals (ε_{it}) of the market model in the test period. It is described as the unexpected return made as a result of the event and is calculated as follows:

$$\widehat{AR_{it}} = R_{it} - \widehat{\alpha_i} - \widehat{\beta_i} R_{mt} \qquad t = 1, 2, \ldots, T \quad (3)$$

α_i represents the average rate of return the stock earns in a period with a zero market return. β_i measures sensitivity to the market return. Both α_i and β_i are computed using five (5),

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ten (10), fifteen (15) and twenty (20) days before the event period to calculate regression parameters for the event windows of five (10), ten (10), fifteen (15) and twenty (20) days before and after the event period respectively (Bodie et al., 2014).

According to Bodie et al. (2014), abnormal return on the announcement date is not sufficient to show the total impact of the information release. It is essential to sum up all the abnormal returns over the period of interest and this is known as the Cumulative Abnormal Return (CAR). The Cumulative Abnormal Return encompasses the total firm-specific stock movement as a result of the market reacting to new information throughout the event period. Cumulative Abnormal Returns (CARs) is computed as follows:

$$CAR_{it} = \sum_{\tau=1}^{t} AR_{i\tau} \tag{6}$$

Cumulative Average Abnormal Returns (CAARs)

$$CAAR_t = \sum_{i=1}^{I} \frac{CAR_{it}}{I} \tag{7}$$

I stands for the number of firms in the sample.

The tests on the statistical significance of ARs and CAR follow the procedures employed by Brown and Warner (1980) and Olowe (2011) as follows:

$$t - stat = \frac{AR_t}{S(AR_t)}$$

AR_t is the abnormal returns at time t and $S(AR_t)$ is the standard deviation of the stock's abnormal returns.

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$$S(AR) = \sqrt{\frac{1}{N^2}\sum_{j=1}^{N}\sigma^2(AR_j)} \quad (8)$$

N is the number of firms and $\sigma^2(AR_j)$ represents the standard deviation of the time series of average residuals throughout the estimation period of each firm and is computed as:

$$\sigma^2(AR_j) = \frac{1}{T-d}\sum_{t}^{N}(\varepsilon_{jt} - \bar{\varepsilon_j})^2$$

$T - d$ degrees of freedom where T is the number of estimation periods (Serra, 2002). In this study, -5, -10, -15 and -20 days before the event period and under market model, d = 2.

3.5 Test statistic

Hypothesis

H_0 : the event of banking reforms does not show abnormal returns on the Ghana Stock Market

H_1 : the event of banking reforms shows abnormal returns on the Ghana Stock Market

The hypothesis purports that if there are no abnormal returns then it presupposes that the market is efficient and vice versa. The movement of stocks to the announcement of the banking reforms would be determined based on the test results using a two-tailed test.

3.6 Model Specification

The cross-sectional model is estimated by regressing the Cumulative Abnormal Returns (CAR_i) against the initial abnormal returns (Cox & Peterson, 1994; Farag & Cressy, 2010; Larson & Madura, 2003) on event date AR_{i0}, firm experience (EXP_i), market capitalization of the firm ($Inmcap_i$) and two dummy variables representing firm ownership (private or government and

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local or foreign). AR_{i0} is the initial abnormal return on event date (t = 0), $Inmcap_i$ is the natural logarithm of the market capitalization of firm *i* one day before the event. $PriOwn_i$ represents the ownership of the firm in terms of whether it is government-owned or privately-owned. $DomOwn_i$ represents the ownership of the firm in terms of whether it is a local or foreign ownership. ε_i is a white noise error term for stock *i*.

$$CAR_i = \mu + \beta_1 AR_{io} + \beta_2 lnMcap_i + \beta_4 PriOwn_i + \beta_5 \text{Dom}Own_i + \varepsilon_i \quad (7)$$

$$i = 1,\ldots,38$$

where $CAR_i = \sum_{t=1}^{11} \frac{CAAR_{it}}{11}$.

3.7 Control Variables

Firm-specific variables are used in the model to examine the stock market reaction of the listed firms to the recent banking reforms. The control variables used in this study include; market capitalization of the firm and ownership. The market capitalization of the firm, denoted by $Mcap_i$, is the product of the share price and the number of shares outstanding (Skiera et al., 2017). According to Dang et al. (2018), market capitalization measures opportunities for firm growth as well as its equity market condition. Several studies use market capitalization to measure the size of a firm. The size of a firm, thus how large or small is, can have an impact on its performance. This is important to establish the equity condition of the listed firms and how they moved across the period which shows whether or not investors of those firms reacted to the news on reforms. Firm market capitalization is measured as the natural logarithm of the market capitalization of the firm one day before the event.

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Private ownership, companies owned private institutions and individuals other than the government denoted by $PriOwn_i$, is a dummy variable which gives the value 1 when the firm is privately owned and 0, if the firm is owned by the government. According to Frydman (1997), private ownership has a positive impact on revenue-generating and resisting exposures to market forces. Investors are naturally attracted to firms with increasing revenues as it gives a good signal to investors about the firm and leads to the demand for those shares to continually increase. Ownership as a control variable was also used by Boubaker et al. (2015) in their study on stock market reaction. Government-owned institutions are faced with political interference which leads to low-motivated managers and impedes productivity (Shleifer et al., 1999; Shleifer & Vishny, 1994).

Domestic ownership, denoted by $DomOwn_i$, is a dummy variable which gives the value 1 when the firm is locally owned and 0, if the firm is owned by a foreign investor. Several researches have found a positive impact on the general performance of foreign-owned firms on the stock market (Goethals & Ooghe, 1997). With the reason that foreign owners prefer liquidity on their investments and exercise control to ensure their investments are liquid (Coffee, 1991).

These control variables provide a more holistic impact on the news of banking reforms on the Ghana Stock Exchange.

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3.8 Chapter Summary

This chapter discussed the sources of data which are from the GSE website (daily returns and firm experience), Annual Reports Ghana website (market capitalization of the individual firms) as well as annual reports of the listed companies (ownership), methods of collecting data (secondary) and event study methodology using the Market model. Cross-sectional regression is used in analyzing the data. It further discussed the control variables (ownership and market capitalization) and metrics encapsulated in this study.

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CHAPTER FOUR

FINDINGS AND DISCUSSION OF RESULTS

4.1 Introduction

This chapter presents the findings that aim to address the objectives of this study and gives an in-depth analysis of the results. The objectives of this study are to examine the reaction of all listed companies to the banking reforms on the GSE using the GSE composite index, the reaction of all listed financial institutions to the banking reforms on the GSE using the GSE financial stock index while testing the semi-strong form efficiency of the GSE in relation to the banking reforms. The Market Model is used in this study to examine the reaction and test for semi-strong form efficiency. The chapter commences with summary statistics which include the descriptive statistics and correlation matrix. Cross-sectional regression is also analyzed in this study to show the reaction and impact of announcement news of recapitalization on the Ghana stock market. It further continues to analyze the significance of the Abnormal Returns and Cumulative Abnormal Returns and displays a graphical presentation of the results.

4.2 Summary Statistics

This section shows the descriptive statistics for the cross-sectional regression giving information about the minimum and maximum values, mean, standard deviation and number of observations. It also presents a correlation matrix that shows the relationship between the variables used in this study. The result from the cross-sectional regression is also presented and discussed.

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Table 4.2.1: Descriptive statistics

GSE COMPOSITE INDEX (CI)

Variable	Obs	Mean	Std. Dev.	Min	Max
CAR	38	.03	.059	-.143	.208
AR	38	.005	.007	-.021	.022
LnMCAP	38	4.484	2.965	-1.05	10.105
PriOWN	38	.895	.311	0	1
DomOWN	38	.579	.5	0	1

GSE FINANCIAL INDEX (FSI)

Variable	Obs	Mean	Std. Dev.	Min	Max
CAR	13	.063	.087	-.111	.241
AR	13	.009	.01	-.016	.027
LnMCAP	13	6.088	1.629	3.156	8.256
PriOWN	13	.769	.439	0	1
DomOWN	13	.615	.506	0	1

The descriptive statistics for the event for the GSE CI companies and GSE FSI companies are presented in Tables 4.2.1 above. The sample for GSE CI includes 38 firms over 5 days before and after the test period. The sample for GSE FSI includes 13 firms over 5 days before and after the test period. The initial abnormal return on event day (AR_{i0}) for CI and FSI are 0.5% and 0.9% respectively. The Cumulative Abnormal Return (CAR_i) over the same event window (5 days before and after the test period) for CI and FSI are 3% and 6.3% respectively. $LnMCAP_i$ for CI and FSI are GH¢88.59 million and GH¢440.54 million respectively. 90% of the CI companies are privately owned while 77% of the FSI companies are privately owned. Finally, 58% of the CI companies are domestically owned while 62% of the FSI companies are domestically owned.

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Table 4.2.2: Correlation Matrix

GSE COMPOSITE INDEX

Variables	(1)	(2)	(3)	(4)	(5)
(1) CAR	1.000				
(2) AR	0.890*	1.000			
(3) LnMCAP	0.076	-0.017	1.000		
(4) PriOWN	0.212	0.188	-0.080	1.000	
(5) DomOWN	-0.146	-0.088	-0.477*	-0.293	1.000

*** p<0.01, ** p<0.05, * p<0.1*

GSE FINANCIAL STOCK INDEX

Variables	(1)	(2)	(3)	(4)	(5)
(1) CAR	1.000				
(2) AR	0.923*	1.000			
(3) LnMCAP	-0.288	-0.468	1.000		
(4) PriOWN	0.289	0.201	0.144	1.000	
(5) DomOWN	0.069	0.054	-0.128	-0.433	1.000

*** p<0.01, ** p<0.05, * p<0.1*

Table 4.2.2 presents the correlation matrix for the variables associated with the event to show the relationship between the variables. All the independent variables in both GSE CI and GSE FSI show no evidence of multi-collinearity as the correlation between the independent variables is less than 0.50. For all listed companies, AR is strongly and positively correlated with the dependent variable CAR and for all listed financial institutions, CAR and AR are also strongly and directly related. This implies that AR is a good predictor of CAR and indicates that as abnormal returns of the companies increase, CAR should also increase. In both GSE CI and GSE FSI, CAR and LnMCAP are positively correlated. This is expected because the market capitalization changes

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daily in relation to the share price of a company for a day. This implies that if Cumulative Abnormal Returns are increasing, it is as a result of increasing share prices because increasing share prices cause market capitalization per firm to increase. The reason for this fluctuation is because of the demand and supply of shares either in response to news or an investor's interest in holding shares on the stock market. The number of shares, however, remains the same. The PriOwn and CAR are directly related in both CI and FSI. This means that investors in private companies made more abnormal returns than those in government-owned firms. There is an inverse relationship between CAR and DomOwn of -0.146 in GSE CI and a positive relationship between CAR and DomOwn of 0.069 in GSE FSI. A negative relationship exists between PriOwn and DomOwn in both GSE CI and GSE FSI which means that most private firms are more likely to be owned by foreign investors and government firms are owned domestically.

Table 4.2.3: Cross-sectional regression

Dependent Variable CAR	**GSE CI**	**GSE FSI**
Independent Variables		
AR	7.854***	8.259***
	(0.7)	(1.206)
LnMCAP	0.00179	0.00864
	(0.00181)	(0.00742)
PriOWN	0.00954	0.0209
	(0.0161)	(0.0277)
DomOWN	-0.00128	0.0142
	(0.0112)	(0.0228)
Constant	-0.024	-0.09
	(0.0227)	(0.0546)
Observations	38	13
R-squared	0.804	0.888
Adjusted R-squared	0.780	0.832

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

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From the cross-sectional regression results in Table 4.2.3 above, AR is positive and significant at a 1% confidence level for both GSE CI and GSE FSI. This implies that AR is a good predictor of CAR. A unit change in AR will cause CAR to change by 785%. It also means that investors earned positive returns during the event period. In GSE FSI also, AR is statistically significant. As AR changes by a unit, CAR will change by 826%. It also means that investors in financial institutions earned positive returns during the event period. In both GSE CI and GSE FSI, LnMCap, PriOwn and DomOwn are not significant. This implies that market capitalization and the ownership of the firm in terms of whether they are private owned or government owned or locally owned or foreign owned does not have a significant impact on the returns earned by investors. The result has an Adjusted R-squared of 0.780 and 0.832 indicating that 78% and 83.2% of all the independent variables are explained by the dependent variable in GSE CI and GSE FSI respectively. This shows that the model is fit.

Table 4.2.4: Cross-sectional regression (with banks)

Dependent Variable CAR	**GSE CI**
Independent Variable	
AR	8.328***
	-1.289
LnMCAP	0.00968
	-0.00831
PriOWN	0.0217
	-0.0294
DomOWN	0.0117
	-0.025
Bank	-0.0126
	-0.0329

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Constant	-0.0854
	-0.059
Observations	13
R-squared	0.890
Adjusted R-squared	0.812

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

To confirm the reaction by investors of other companies other than banks and insurance companies, the variable Bank was included as seen in the table above. Bank, denoted by Bank, is a dummy variable which gives the value 1, when the firm is a bank and 0, if the firm is an insurance company. This variable is not significant, and does not statistically differ from the results of GSE FSI which includes all listed financial institutions and confirms results that on average, investors in listed companies made positive returns during the period. The Adjusted R-squared after including banks as a dummy variable is 81.2% still indicating that the model is fit.

4.3 Empirical Findings and Discussions

This section discusses the findings of this study. This is done by computing the Average Abnormal Returns and Cumulative Abnormal Returns and their significance. It further shows graphs to give a graphical presentation of the figures and analyzes the graphs in comparison with how graphs of efficient markets ought to be. The data for the study is based on 38 listed companies on the GSE Composite Index (GSE CI) and 13 listed companies on the GSE Financial Index (GSE FSI). It uses a test period of 5 days before and after the event with the event date being 11th September 2017 which is the announcement date of the increase in the minimum capital requirement. This study further observes a test period of ten days, fifteen days and twenty days before and after the

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event date. The main variables used in the study are the Cumulative Abnormal Returns which is the dependent variable and the Abnormal Returns which is the main independent variable with stock prices taken from the Ghana Stock Exchange.

Below is Table 4.3.1 which shows the Average Abnormal Returns and Cumulative Average Abnormal Returns for the test period [-5, +5] for both GSE Composite Index and GSE Financial Stock Index. The days which investors made significant returns are presented under the t-statistics column in bold.

Table 4.3.1: Average Abnormal Returns and Cumulative Average Abnormal Returns - GSE Composite Index and GSE Financial Stock Index [-5, +5]

	GSE CI				GSE FSI			
	AAR	**t-stat**	**CAAR**	**t-stat**	**AAR**	**t-stat**	**CAAR**	**t-stat**
-5	-0.0048	-0.8898	-0.0048	-0.8898	0.0083	0.9724	0.0083	0.9724
-4	0.0061	1.125	0.0013	0.2352	0.01	1.1729	0.0184	**2.1453****
-3	0.0014	0.2583	0.0027	0.4935	-0.0029	-0.3362	0.0155	**1.8091***
-2	0.0084	1.5567	0.0111	**2.0502****	0.0163	**1.9004***	0.0318	**3.7095*****
-1	0.0156	**2.8905*****	0.0266	**4.9408*****	0.0327	**3.8199*****	0.0645	**7.5294*****
0	0.012	**2.2189****	0.0386	**7.1597*****	0.0104	1.2167	0.0749	**8.7461*****
1	0.0056	1.0468	0.0442	**8.2065*****	0.0132	1.5393	0.0881	**10.2854*****
2	0.0035	0.6547	0.0478	**8.8612*****	0.0022	0.2577	0.0903	**10.5431*****
3	0.0064	1.1806	0.0541	**10.0418*****	0.0104	1.2119	0.1006	**11.7551*****
4	0.0026	0.4786	0.0567	**10.5204*****	-0.0001	-0.0135	0.1005	**11.7416*****
5	-0.0029	-0.5375	0.0538	**9.9829*****	0.0001	0.0132	0.1006	**11.7548*****

***, **, * represent significance at the 1%, 5% and 10% levels respectively.

Table 4.3.1 presents the Average Abnormal Returns (AARs) and Cumulative Average Abnormal Returns (CAARs) and their t-statistics over event window [−5; +5] for both for all companies listed on the Ghana Stock Exchange (GSE CI) and all listed financial institutions on the Ghana Stock

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Exchange (GSE FSI). In the computation of AARs, for GSE CI, there are significant returns a day to the announcement day and on the announcement day at 1% and 5% confidence level respectively while with GSE FSI, there are significant returns two days to the announcement day and on a day to the announcement day at 10% and 1% confidence level respectively. This implies that on average, investors in listed companies made significant returns a day to the event date and on the event date because stock prices soar up on these days. Investors who bought shares before this date earned positive returns on their investment. However, with the post-event period, there are no significant AARs for both GSE CI and GSE FSI. For pre-event CAARs, there were positive and significant CAARs 2 days and 4 days to the event date for GSE CI and GSE FSI respectively. Both GSE CI and GSE FSI also show positive significant CAARs on the event date and 5 days after the event date at 1% significance level. This indicates that investors perceived the news of recapitalization as a good one and an opportunity to make the financial market more robust and promote economic growth. This resulted in the demand of shares to rise during this period causing stock prices to rise and investors who held shares during this period to earn positive returns on their investment.

Expanding the results to cover earlier and later periods to have a comprehensive view of the market, this study expounded to present results for reactions ten (10) days [-10, +10], fifteen (15) days [-15, +15] and twenty (20) days [-20, +20] before and after the event date using estimation periods of ten (10), fifteen (15) and twenty (20) days respectively in addition to the five days presented.

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Table 4.3.2: Average Abnormal Returns and Cumulative Average Abnormal Returns - GSE Composite Index and GSE Financial Stock Index [-10,+10]

	GSE CI				GSE FSI			
	AAR	t-stat	CAAR	t-stat	AAR	t-stat	CAAR	t-stat
-10	-0.0053	-0.9211	-0.0053	-0.9211	0.002	0.2027	0.002	0.2027
-9	0.0014	0.2412	-0.0039	-0.6799	-0.0012	-0.1191	0.0008	0.0836
-8	0.0007	0.1189	-0.0032	-0.561	-0.0018	-0.1848	-0.001	-0.1011
-7	-0.0042	-0.7367	-0.0074	-1.2978	0.0002	0.0228	-0.0008	-0.0784
-6	-0.0013	-0.2359	-0.0088	-1.5336	-0.003	-0.3062	-0.0038	-0.3846
-5	-0.0123	**-2.1565****	-0.0211	**-3.6902*****	0.0066	0.666	0.0028	0.2814
-4	0.0052	0.903	-0.0159	**-2.7872**	0.0102	1.0302	0.013	1.3116
-3	0.0001	0.0215	-0.0158	**-2.7657*****	-0.0036	-0.3665	0.0093	0.9451
-2	0.0094	**1.6456***	-0.0064	-1.12	0.0207	**2.0946****	0.03	**3.0397*****
-1	0.0233	**4.0768*****	0.0169	**2.9568*****	0.0517	**5.2345*****	0.0817	**8.2741*****
0	0.0127	**2.2274****	0.0296	**5.1842*****	0.0145	1.4656	0.0962	**9.7398*****
1	0.008	1.3989	0.0376	**6.5831*****	0.0207	**2.0954****	0.1169	**11.8352*****
2	0.0044	0.7775	0.0421	**7.3607*****	0.0067	0.6783	0.1236	**12.5134*****
3	0.0073	1.276	0.0494	**8.6367*****	0.0147	1.4913	0.1384	**14.0048*****
4	0.0027	0.4684	0.0521	**9.1051*****	0.0022	0.2206	0.1405	**14.2254*****
5	-0.0023	-0.4058	0.0497	**8.6993*****	0.0033	0.3291	0.1438	**14.5545*****
6	0.0016	0.2748	0.0516	**9.0207*****	-0.0006	-0.0588	0.1454	**14.7176*****
7	0.0017	0.29	0.0532	**9.3106*****	0.0006	0.0596	0.146	**14.7772*****
8	0.0032	0.5657	0.0565	**9.8763*****	0.0007	0.0673	0.1466	**14.8445*****
9	0.0072	1.2508	0.0636	**11.1271*****	-0.0032	-0.328	0.1434	**14.5165*****
10	0.0027	0.47	0.0663	**11.5970*****	0.0022	0.2206	0.1456	**14.7371*****

***, **, * represent significance at the 1%, 5% and 10% levels respectively.

Using event period of [-10,+10] per Table 4.3.2 above, presents the Average Abnormal Returns (AARs) and Cumulative Average Abnormal Returns (CAARs) and their t-statistics over event window [−10, +10] for both GSE CI and GSE FSI.

For GSE CI, five days to the event date, there was a negative statistical significance at 5% confidence level and positive returns two days, a day to the event date and the event date itself for AAR. For all the financial institutions, on average, there were positive returns two days to the

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event date, a day to the event date and a day after the event date at 5%, 1% and 5% significance level respectively. There were negative CAARs five (5), four (4) and three (3) days to the event date on average for all listed companies which implies that negative returns were made by investors on these days. From a day to the event to ten days after the event date, positive CAARS were realized which shows that investors earned positive returns during this period on average for all listed companies. This implies that investors perceived the news of recapitalization as a good one and an opportunity to make the financial market more robust and promote economic growth. This resulted in more investors buying shares than selling thereby causing stock prices to rise. Likewise, for GSE FSI, there were positive CAARS two days to the event date to ten days after the event day emphasizing investors' reaction on the two sides.

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Table 4.3.3: Average Abnormal Returns and Cumulative Average Abnormal Returns - GSE Composite Index and GSE Financial Stock Index [-15,+15]

	GSE CI				GSE FSI			
	AAR	t-stat	CAAR	t-stat	AAR	t-stat	CAAR	t-stat
-15	-0.0005	-0.1347	-0.0005	-0.1347	0.0015	0.2002	0.0015	0.2002
-14	-0.0067	-1.7456	-0.0072	-1.8803	0.005	0.6592	0.0066	0.8594
-13	0.001	0.2577	-0.0063	-1.6226	0.0086	1.1248	0.0152	**1.9843****
-12	0.0098	**2.5343****	0.0035	0.9118	0.0104	1.3592	0.0255	**3.3435*****
-11	-0.0003	-0.0655	0.0033	0.8462	0.013	**1.6976***	0.0385	**5.0411*****
-10	-0.0058	-1.4969	-0.0025	-0.6507	0.0052	0.6843	0.0437	**5.7254*****
-9	0.0008	0.2102	-0.0017	-0.4405	0.0011	0.1494	0.0449	**5.8748*****
-8	0.0003	0.0749	-0.0014	-0.3656	0.0028	0.3602	0.0476	**6.2350*****
-7	-0.0042	-1.0978	-0.0056	-1.4634	0.0033	0.4385	0.051	**6.6735*****
-6	-0.0014	-0.3697	-0.0071	**-1.8331***	0.0036	0.4765	0.0546	**7.1500*****
-5	-0.0111	**-2.8780*****	-0.0182	**-4.7111*****	0.0118	1.5506	0.0664	**8.7006*****
-4	0.0046	1.1987	-0.0135	**-3.5123*****	0.013	**1.7017***	0.0794	**10.4023*****
-3	-0.0003	-0.0828	-0.0139	**-3.5951*****	0.0003	0.0442	0.0798	**10.4464*****
-2	0.0084	**2.1668****	-0.0055	-1.4283	0.0179	**2.3497****	0.0977	**12.7961*****
-1	0.0205	**5.3064*****	0.015	**3.8782*****	0.03	**3.9314*****	0.1277	**16.7276*****
0	0.0117	**3.0464*****	0.0267	**6.9245*****	0.0122	1.5972	0.1399	**18.3248*****
1	0.0066	**1.7083***	0.0333	**8.6328*****	0.0139	**1.8237***	0.1539	**20.1485*****
2	0.0034	0.8867	0.0367	**9.5194*****	0.0039	0.5053	0.1577	**20.6538*****
3	0.0063	1.6247	0.043	**11.1442*****	0.0121	1.5804	0.1698	**22.2342*****
4	0.0019	0.4851	0.0448	**11.6293*****	0.0022	0.2872	0.172	**22.5214*****
5	-0.0033	-0.8444	0.0416	**10.7849*****	0.0022	0.2841	0.1741	**22.8056*****
6	0.001	0.2542	0.0436	**11.2996*****	0.0016	0.2078	0.1841	**24.1047*****
7	0.0011	0.2881	0.0447	**11.5877*****	0.0031	0.4099	0.1872	**24.5146*****
8	0.0021	0.5556	0.0468	**12.1433*****	-0.002	-0.2667	0.1852	**24.2480*****
9	0.0063	1.6412	0.0531	**13.7845*****	-0.0032	-0.4176	0.182	**23.8304*****
10	0.0019	0.4987	0.0551	**14.2832*****	0.0021	0.2786	0.1841	**24.1090*****
11	0.0003	0.0779	0.0554	**14.3611*****	0.0014	0.1864	0.1855	**24.2954*****
12	0.0008	0.2067	0.0562	**14.5678*****	0.001	0.1368	0.1866	**24.4322*****
13	-0.0146	**-3.7747*****	0.0416	**10.7931*****	-0.0276	**-3.6090*****	0.159	**20.8232*****
14	0.0005	0.1201	0.0421	**10.9133*****	0.0045	0.5915	0.1635	**21.4147*****
15	0.014	**3.6385*****	0.0561	**14.5518*****	0.025	**3.2711*****	0.1885	**24.6857*****

***, **, * represent significance at the 1%, 5% and 10% levels respectively.

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In the computation of AARs, for GSE CI, there were positive AARs 12 days to the event date as presented in Table 4.3.3 above. However, five days to the event, investors made negative returns at 1% significant value. Positive returns were again made two days to the event date, a day to the

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event date, the date of the event and a day after the event date as well as fifteen days after the event date. Negative AARs were however made thirteen days after the event date. In terms of the CAARs, investors made negative CAARS six days to the event date to three days to the announcement day and a day to the announcement day to fifteen days after the announcement date positive CAARS were made at 1% confidence level. For GSE FSI, there were positive AARS 11 days, 4 days, 2 days and a day to the event date. If an investor bought a stock before 11 days, 4 days, 2 days and a day before the announcement of the increase in minimum capital requirement bank capital requirements, that investor can earn statistically significant positive AR on those days. Positive returns were again made a day after the event date and fifteen days after the event date. Negative AARs were however made thirteen days after the event date similar to GSE CI. In terms of the CAARs, investors made positive CAARS 12 days to the event date to fifteen days after the announcement date. This implies that on average, investors in listed companies made significant returns a day to the event date and on the event date because stock prices soar up on these days. Investors who bought shares before this date earned positive returns on their investment.

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Table 4.3.4: Average Abnormal Returns and Cumulative Average Abnormal Returns - GSE Composite Index and GSE Financial Stock Index [-20,+20]

	GSE CI				GSE FSI			
	AAR	t-stat	CAAR	t-stat	AAR	t-stat	CAAR	t-stat
-20	-0.0119	**-2.7491*** **	-0.0119	**-2.7491*** **	-0.0058	-0.8149	-0.0058	-0.8149
-19	0.0002	0.0454	-0.0117	**-2.7038*** **	-0.001	-0.1432	-0.0068	-0.9581
-18	-0.0007	-0.1534	-0.0124	**-2.8572*** **	-0.0073	-1.0268	-0.0141	**-1.9849** **
-17	-0.0016	-0.3799	-0.014	**-3.2371*** **	-0.0138	-1.9503	-0.0279	**-3.9353*** **
-16	0.0025	0.5739	-0.0116	**-2.6632*** **	0.0039	0.5571	-0.0239	**-3.3782*** **
-15	0.0021	0.4898	-0.0094	**-2.1734** **	0.0063	0.884	-0.0177	**-2.4942** **
-14	-0.001	-0.2251	-0.0104	**-2.3985** **	0.0198	**2.7958*** **	0.0021	0.3016
-13	0.0018	0.4219	-0.0086	**-1.9766** **	0.009	1.271	0.0111	1.5726
-12	0.0121	**2.7938*** **	0.0035	0.8173	0.0129	**1.8286** *	0.0241	**3.4012*** **
-11	0.0047	1.0758	0.0082	**1.8931** *	0.0149	**2.1016** **	0.039	**5.5029*** **
-10	-0.0051	-1.1857	0.0031	0.7073	0.0055	0.783	0.0445	**6.2859*** **
-9	0.0009	0.1992	0.0039	0.9065	-0.001	-0.1459	0.0435	**6.1400*** **
-8	0.002	0.4564	0.0059	1.363	0.0062	0.8766	0.0497	**7.0166*** **
-7	0.0009	0.2006	0.0068	1.5636	0.0028	0.3986	0.0525	**7.4152*** **
-6	0.0032	0.7294	0.0099	**2.2930** **	0.0118	**1.6688** *	0.0643	**9.0840*** **
-5	0.0056	1.285	0.0155	**3.5780*** **	0.017	**2.3991** **	0.0813	**11.4831*** **
-4	0.0049	1.1373	0.0205	**4.7153*** **	0.0121	**1.7102** *	0.0934	**13.1932*** **
-3	0.0009	0.2074	0.0214	**4.9228*** **	0.0031	0.4416	0.0965	**13.6348*** **
-2	0.0039	0.9068	0.0253	**5.8296*** **	0.0072	1.0238	0.1038	**14.6586*** **
-1	-0.0005	-0.1182	0.0248	**5.7114*** **	-0.0289	**-4.0804*** **	0.0749	**10.5782*** **
0	0.0079	**1.8270** *	0.0327	**7.5384*** **	0.0006	0.0778	0.0754	**10.6560*** **
1	-0.0011	-0.262	0.0316	**7.2765*** **	-0.0091	-1.2801	0.0664	**9.3759*** **
2	-0.0008	-0.1738	0.0308	**7.1027*** **	-0.0097	-1.3707	0.0567	**8.0052*** **
3	0.0021	0.4737	0.0329	**7.5764*** **	-0.0014	-0.2035	0.0552	**7.8017*** **
4	-0.0003	-0.0656	0.0326	**7.5107*** **	-0.0047	-0.6678	0.0505	**7.1339*** **
5	-0.0066	-1.5199	0.026	**5.9909*** **	-0.0078	-1.1067	0.0427	**6.0272*** **
6	0.0008	0.1908	0.0275	**6.3327*** **	-0.0007	-0.0935	0.0491	**6.9359*** **
7	0.0014	0.3141	0.0288	**6.6468*** **	0.0025	0.3544	0.0516	**7.2903*** **
8	-0.0026	-0.6068	0.0262	**6.0400*** **	-0.0156	**-2.2089** **	0.036	**5.0815*** **
9	0.004	0.9302	0.0302	**6.9703*** **	-0.0102	-1.4352	0.0258	**3.6463*** **
10	0.0002	0.0393	0.0304	**7.0096*** **	-0.0054	-0.7629	0.0204	**2.8834*** **
11	0.0004	0.0988	0.0308	**7.1084*** **	-0.0007	-0.1046	0.0197	**2.7788*** **
12	0.0002	0.0346	0.031	**7.1430*** **	-0.0041	-0.5845	0.0155	**2.1944** **
13	-0.0025	-0.5656	0.0285	**6.5774*** **	0.0068	0.9553	0.0223	**3.1497*** **
14	0.0027	0.6146	0.0312	**7.1921*** **	0.0115	1.623	0.0338	**4.7727*** **
15	0.0025	0.5874	0.0337	**7.7795*** **	-0.0088	-1.2473	0.025	**3.5254*** **
16	0.0004	0.0969	0.0342	**7.8763*** **	-0.0031	-0.4436	0.0218	**3.0818*** **
17	-0.0043	-0.9865	0.0299	**6.8898*** **	-0.0222	**-3.1322*** **	-0.0004	-0.0504
18	-0.0107	**-2.4563** **	0.0192	**4.4335*** **	-0.0018	-0.2513	-0.0021	-0.3017
19	0.0112	**2.5836*** **	0.0304	**7.0171*** **	-0.0016	-0.2326	-0.0038	-0.5343
20	0.0049	1.1389	0.0354	**8.1561*** **	0.0128	**1.8132** *	0.0091	1.2789

***, **, * represent significance at the 1%, 5% and 10% levels respectively.

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Using event period of [-20, +20] presents the Average Abnormal Returns (AARs) and Cumulative Average Abnormal Returns (CAARs) and their t-statistics over event window [−20, +20] for both GSE CI and GSE FSI as shown in Table 4.3.4 above.

For GSE CI, twenty days to the event date, there was a negative statistical significance at 1% confidence level and positive returns twelve days and the event date itself for AAR. For all the financial institutions, on average, there were positive returns fourteen, twelve, eleven, six, five and four days to the event date. There were negative CAARs one (1), eight (8) and seventeen (17) days after the event date on average for all listed financial companies which implies that negative returns were made by investors on these days. Positive AARs were made twenty (20) days after the event date.

From twenty days to the event to thirteen days to the event date, negative CAARS were exhibited which shows some investors selling off their shares causing prices to fall and investors to make negative returns during this period on average for all listed companies GSE CI). Six days to the event date to twenty days after the event date, positive returns were made by investors under the GSE CI. For GSE FSI, eighteen to fifteen days before the event date negative CAARs were made by investors which resulted from more investors selling off their shares than buying thereby causing stock prices to fall. However, twelve days to the event date to sixteen days after the event date, positive returns were made by investors. The positive impact on share prices could be attributed to high anticipation of investors to earn returns on their shares as banks issue shares to raise the extra capital and investors buy those shares thereby resulting in an increase in the demand

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of shares causing share price to increase and investors who held shares prior to this period earned abnormal returns.

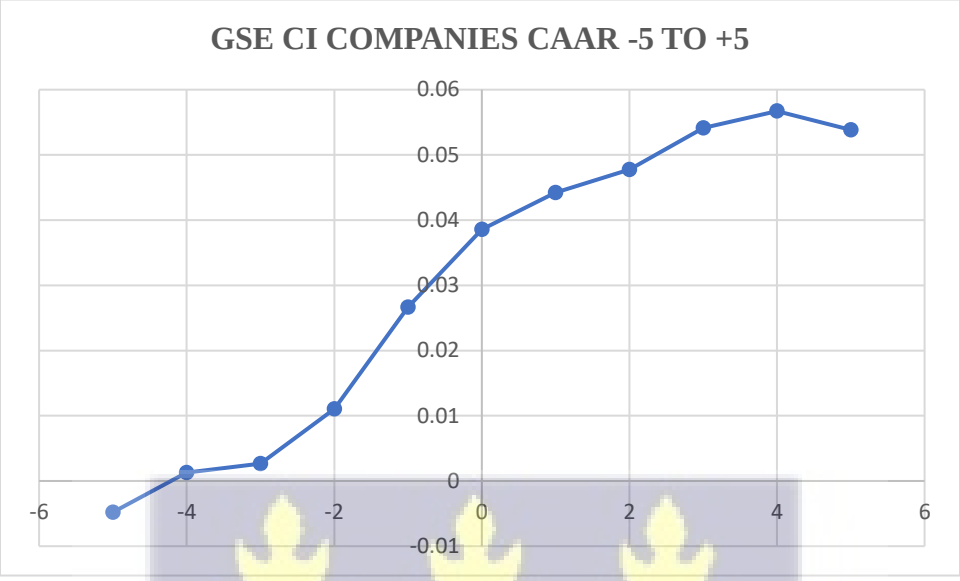

Figure 4.1 GSE CI Companies [-5,+5]

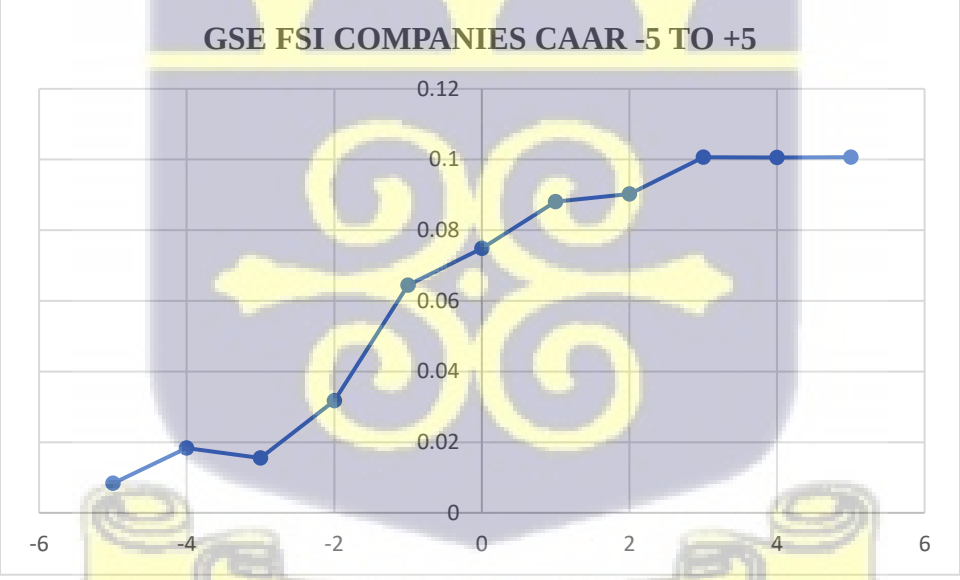

Figure 4.2 GSE FSI Companies [-5,+5]

Figures 4.1 and 4.2 above illustrate the CAAR values over the test period [-5, +5] for GSE CI and GSE FSI respectively. The two graphs are moving in the same direction with CAARs increasing

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gradually from 5 days to the event date to four days after the event date and dropping slightly on day 5 for GSE CI but being stable from day four to day five for GSE FSI. The upward movement of CAAR represents investors earning positive returns. Investors found the recapitalization news as good news and bid up the stock price. The prevalence of significant ARs infers that some investors were able to spot mispriced shares and gain ARs by taking either a short position or long position. This should not have been the case in an efficient market which would have limited the occurrence of some investors gaining. The abnormal returns posits that the Ghana stock market is inefficient in the semi-strong from which is similar to the findings of Olowe (2011) who studied the impact of the announcement of the 2004 bank recapitalization on the Nigerian stock market.

Mispriced securities is detected in the graphs [-10,+10], [-15,+15] and [-20,+20] for both GSE CI and GSE FSI as shown below reiterating that investors gained ARs by taking either a short position or long position.

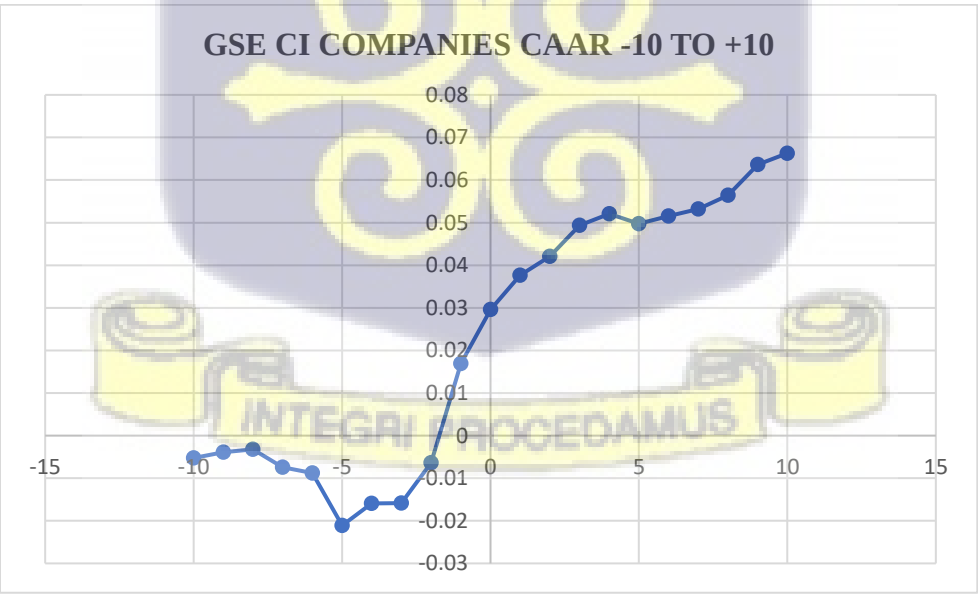

Figure 4.3 GSE CI Companies [-10,+10]

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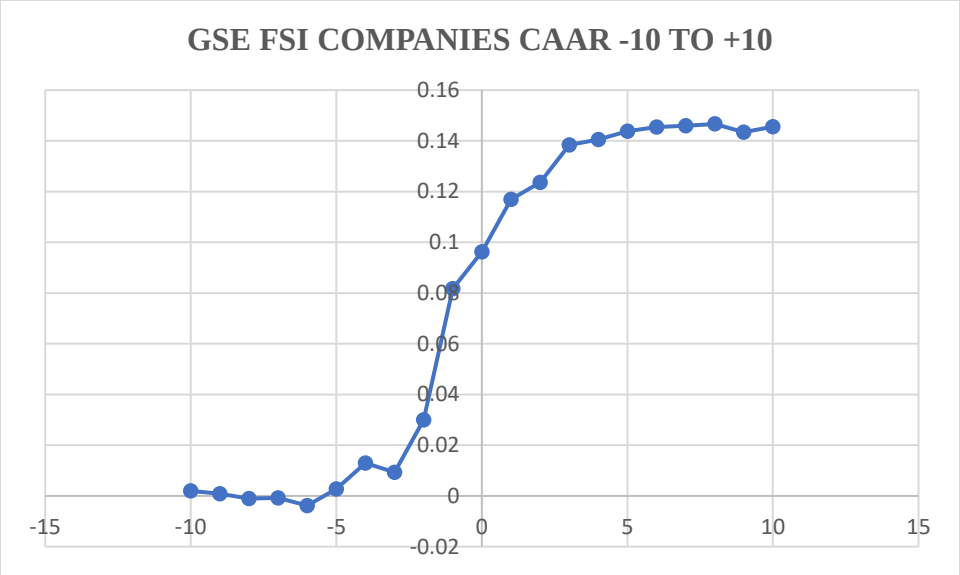

Figure 4.4 GSE FSI Companies [-10,+10]

Figure 4.3 and 4.4 show the CAAR values over the test period [-10, +10] for GSE CI and GSE FSI using the market model. For GSE CI, from -10 to -8, CAAR values were relatively stable but dropped from -0.561 in 8 days before the event day to -3.6902 in 5 days before the event day and thereafter began to rise. For GSE FSI, from -10 to -6, CAAR values were relatively stable but began to rise after 6 days before the event day. The GSE FSI graphs just like the GSE CI show that on the event day, positive CAARs were made by investors who had shares before this day. CAARs in both GSE CI and GSE FSI are comparatively stable with positive returns being earned by investors from event day to ten days after the event day. This implies that on the average, all investors of listed companies and all listed financial institutions reacted positively to the news of recapitalization. The reason for this reaction could be as a result of high anticipation among the investors that the recapitalization exercise would boost the financial system.

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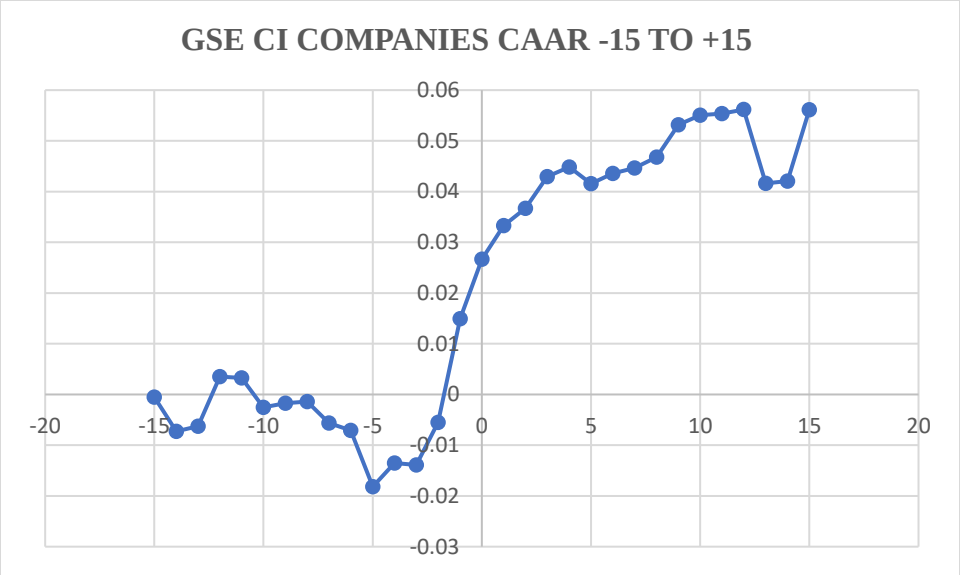

Figure 4.5 GSE CI Companies [-15,+15]

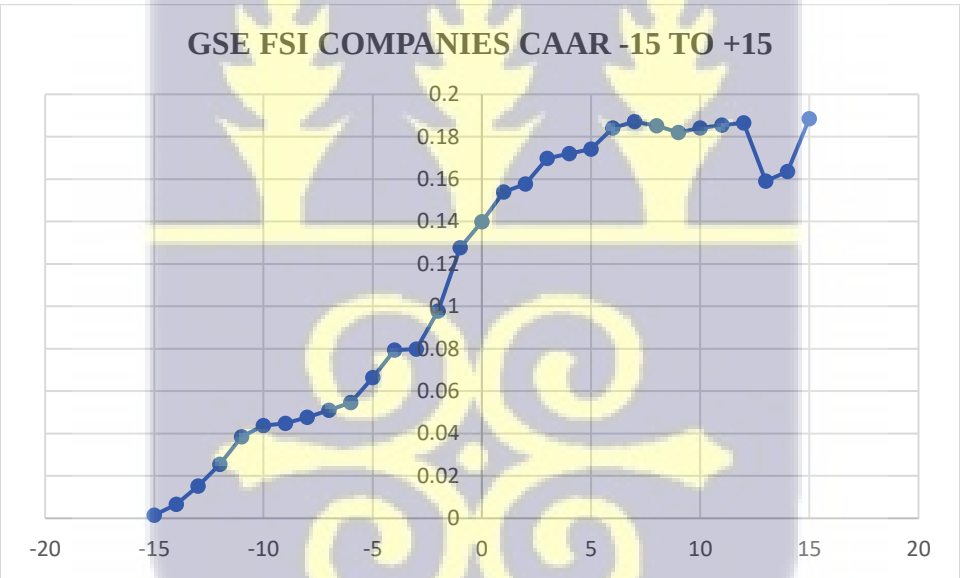

Figure 4.6 GSE FSI Companies [-15,+15]

Figure 4.6 shows that prior to the announcement date, on average for all listed financial institutions, CAARs were gradually increasing from fifteen days before the event day with CAAR of 0.0015 to 0.0437 which is the CAAR for ten days before the event day and increasing further to 0.1399 on the event day. With GSE CI on the other hand as shown in Figure 4.5, movement on the graph

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is relatively unstable from fifteen days before the event day to the event day. CAARs were plummeting from fifteen days before the event day with CAAR of -0.0005 to 14 days before the event day with CAAR of -0.0072 and was moderately stable from -14 (-0.0072) to -13 (-0.0063) and thereafter began to rise from -13 (-0.0063) to -12 (0.0035) and stable from -12 (0.0035) to -11 (0.0033) after which CAARs fell on -10 (-0.0025). From -10 (-0.0025) to -8 (-0.0014), CAARs rose slightly and reduced after -8 and continued to decrease till -5 (-0.0182) after which it increased a bit from -5 (-0.0182) to -4 (-0.0135), remained stable for a day and thereafter short up from -3 and continued to the announcement date. After the announcement date however, results in both GSE CI and GSE FSI are similar with investors earning positive returns on post announcement days.

Figure 4.7 GSE CI Companies [-20,+20]

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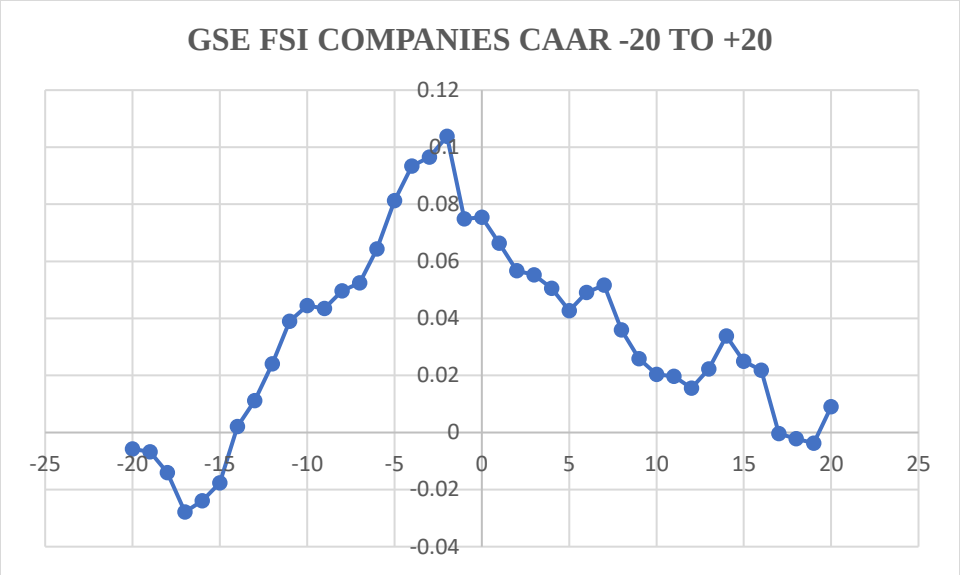

Figure 4.8 GSE FSI Companies [-20,+20]

For [-20, +20], pre-event days, Figure 4.7 and Figure 4.8 are similar for both GSE CI and GSE FSI. However, post event period, Figure 4.7 and Figure 4.8 seem to be moving in the opposite direction. From CAAR values as shown in Table 4.4 above, although CAAR values in GSE FSI seem to be reducing per the graph above as against GSE CI, in both cases positive CAARs were made. The only difference is that the returns made by investors in financial institutions were reducing although positive and significant and the returns made by investors in all listed companies were increasing during that period.

4.4 Chapter Summary

From the analysis, the results showed a reaction of the stock market to the recent banking reforms. The reason for this reaction could be as a result of high anticipation among the investors that the recapitalization exercise would boost the financial system. This resulted in the demand of shares to rise during this period ensuing in more investors buying shares than selling thereby causing

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stock prices to rise. Investors who held shares during this period earned positive returns on their investment. The positive impact on share prices could also be attributed to banks issuing shares to raise the extra capital and investors buying those shares thereby giving rise to an increase in the demand of shares triggering share price to increase. Additionally, in the cross-sectional regression, the Market model shows a positive relationship between Cumulative Abnormal Returns and Abnormal Returns for both GSE CI and GSE FSI.

The upward movement of CAAR represents investors earning positive returns. The prevalence of significant ARs infers that some investors were able to spot mispriced shares springing from inadequate circulation of information in the stock market and gain abnormal returns by taking either a short position or long position. This should not have been the case in an efficient market which would have limited the occurrence of some investors gaining. In addition to that, some investors made significant abnormal returns even days after the event date. This infers that the Ghana stock market is deemed to be inefficient in the semi-strong form which is similar to the findings of Olowe (2011) who studied the impact of the announcement of the 2004 bank recapitalization on the Nigerian stock market.

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CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This final chapter highlights the summary of this study and draws conclusions based on the whole study. It summarizes the findings arrived at and based on that provides significant recommendations for policy and future research. It also states the implications of regulatory standards on the GSE and certain considerations that need to be made before coming out with significant regulations and reforms.

5.2 Summary of Findings

The purpose of this study was to examine the reaction of the Ghana Stock Exchange to the recent banking reforms and to test the semi-strong form efficiency of the GSE. Data was employed from the Ghana Stock Exchange website, Annual Reports Ghana website and the annual reports of the listed companies with companies and sources as well as some details shown in Appendices 1, 2 and 3. Both the GSE composite and financial indexes were used with an event period of 5 days before and after the event from 4th September to 18th September 2017 with the event date being 11th September 2017.

This study found that there is a reaction of the Ghana stock market to the recent banking reforms. The reason for this reaction could be as a result of high anticipation among the investors that the recapitalization exerci\se would boost the financial system. This resulted in the demand of shares to rise during this period resulting in resulted in more investors buying shares than selling thereby

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causing stock prices to rise and investors who held shares during this period earned positive returns on their investment. The positive impact on share prices could also be attributed to banks issuing shares to raise the extra capital and investors buying those shares thereby giving rise to an increase in the demand of shares triggering share price to increase. Additionally, in the cross-sectional regression, the Market model shows a positive relationship between Cumulative Abnormal Returns and Abnormal Returns for both GSE CI and GSE FSI.

The upward movement of CAAR represents investors earning positive returns. The prevalence of significant ARs infers that some investors were able to spot mispriced shares springing from inadequate circulation of information in the stock market and gain ARs by taking either a short position or long position. This should not have been the case in an efficient market which would have limited the occurrence of some investors gaining. In addition to that, some investors made significant abnormal returns even days after the event date. This infers that the Ghana stock market is deemed to be inefficient in the semi-strong form which is similar to the findings of Olowe (2011) who studied the impact of the announcement of the 2004 bank recapitalization on the Nigerian stock market.

5.3 Conclusion

There was a reaction to the banking reforms on the Ghana Stock Exchange. Also, the study found that the Ghana Stock Exchange is not efficient in the semi-strong form. Generally, the model adopted for this study was fit, as the independent variables were explained by the dependent variable in GSE CI and GSE FSI respectively. A likely reason for the upward movement in CAARs

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after the event date could be attributed to investors buying shares from banks to enable them to meet the new minimum capital requirement. Investors probably saw this as an opportunity to buy shares now and later sell them when stock prices increase. Some of the banks raised extra capital from the stock market, others through injection of fresh capital from existing shareholders while others raised it by adding their income surplus to their stated capital and holding up dividend payment for the year to be used to raise the extra capital.

5.4 Recommendations

Recommendations towards Policy and for future research are discussed under sub-sections 5.4.1 and 5.4.2 as referenced below.

5.4.1 Recommendations towards Policy

Regulators need to put in controls to overcome market imperfections in order to raise the level of market efficiency in the Ghanaian stock market to improve market liquidity. Some controls include sensitizing Ghanaians to invest in the stock market so as to increase the number of investors on the Ghana stock market. Having more investors trading would increase the absorption rate of new information thereby making the market more efficient. Also, regulators should ensure that all information and financial reports are made available to all investors on an equal basis. Regulators should also ensure that insider trading of material information is circumvented to help curb market inefficiency and improve liquidity.

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Furthermore, regulators should be cognizant of the impact of their policies on the stock market and various industries in the financial sector in order to consider these factors when making decisions.

The Ghana Stock Exchange should also focus on educating investors on how the stock market works to enable them to make good investment decisions which would improve liquidity in the Ghanaian stock market.

5.4.2 Recommendations for future research

Future studies can explore other models like the mean adjusted model and capital asset pricing model which could increase the robustness of the results. Also, other researchers can observe the reaction across the various sectors listed on the Ghana Stock Exchange to observe the reaction by investors for each sector.

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APPENDIX 1

Table A1: Companies used for GSE Composite Index during the study period

No.	ABBR	GSE CI COMPANIES
1	AADS	AngloGold Ashanti Depository Shares
2	ACCESS	Access Bank Ghana PLC
3	ACI	African Champion Industries Limited
4	ADB	Agricultural Development Bank
5	AGA	AngloGold Ashanti Limited
6	ALW	Aluworks LTD
7	AYRTN	Ayrton Drug Manufacturing Limited
8	BOPP	Benso Oil Palm Plantation Ltd
9	CAL	Cal Bank PLC
10	CLYD	Clydestone (Ghana) Limited
11	CMLT	Camelot Ghana Ltd
12	CPC	Cocoa Processing Company
13	EGH	Ecobank Ghana PLC
14	EGL	Enterprise Group PLC
15	ETI	Ecobank Transnational Incorporation
16	FML	Fan Milk Limited
17	GCB	Ghana Commercial Bank Limited
18	GGBL	Guinness Ghana Breweries Plc
19	GOIL	Ghana Oil Company Limited
20	GSR	Golden Star Resources Ltd.
21	GWEB	Golden Web Limited
22	MAC	Mega African Capital Limited
23	MLC	Mechanical Lloyd Company PLC
24	PBC	Produce Buying Company Ltd.
25	PKL	Pioneer Kitchenware Limited
26	PZC	PZ Cussons Ghana Ltd
27	RBGH	Republic Bank (Ghana) PLC.
28	SCB	Standard Chartered Bank Ghana Ltd.
29	SIC	SIC Insurance Company Limited
30	SOGEGH	Societe Generale Ghana Limited
31	SPL	Starwin Products Limited
32	SWL	Sam Wood Ltd.
33	TBL	Trust Bank Limited (The Gambia)
34	TOTAL	Total Petroleum Ghana PLC
35	TLW	Tullow Oil PLC
36	TRANSOL	Transol Solutions Ghana Limited
37	UNIL	Unilever Ghana PLC
38	UT	UT Bank

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APPENDIX 2

Table A2: Companies used for GSE Financial Index during the study period

No.	ABBR	GSE FSI COMPANIES
1	ACCESS	Access Bank Ghana
2	ADB	Agricultural Development Bank
3	CAL	CAL Bank Limited
4	EGH	Ecobank Ghana Ltd
5	EGL	Enterprise Group Limited
6	ETI	Ecobank Transnational Incorporation
7	GCB	Ghana Commercial Bank Limited
8	RBGH	Republic Bank (Ghana) Ltd
9	SCB	Standard Chartered Bank Ghana Ltd.
10	SIC	SIC Insurance Company Limited
11	SOGEGH	Societe Generale Ghana Limited
12	TBL	Trust Bank Limited (THE GAMBIA)
13	UT	UT Bank

APPENDIX 3

Table A3: Data Source

Data	Source
Daily Stock Prices	Ghana Stock Exchange Website
GSE Composite and Financial Indices	Ghana Stock Exchange Website
Firm Market Capitalization	Annual Reports Ghana Website
Ownership of Firm	Annual Reports of the Listed Companies

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