



Ashesi University

The Impact of Regulation on the Performance of Universal Banks in Ghana

By

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Supervised by Esther Laryea

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DECLARATION

I hereby declare that this thesis is my original work and that no part of it has been presented for another degree in this university or elsewhere.

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I hereby declare that the preparation and presentation of this thesis was supervised in accordance with the guidelines on supervision of theses established by Ashesi University

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ABSTRACT

This research paper studies the impact of banking regulations on the performance of universal banks in Ghana. The study uses OLS regression for panel data to analyze the impact of the banking regulations on profitability and efficiency metrics of six universal banks listed on the Ghana Stock Exchange. The research uses data collected from 2005 to 2017. The first aim of the study is to identify previous regulatory changes and their impact on the performance of the universal banks. The second aim is to forecast the impact of future regulations on universal banks after the recent Ghana banking crisis. The use of capital adequacy ratio as the sole regulation is because of the recent banking crisis that mainly affected universal and commercial banks. The results of the study show that banking regulation has a positive relationship with return on assets, but a negative relationship with operating expense ratio.

LIST OF ABBREVIATIONS

BOG.....	Bank of Ghana
CAL.....	CAL Bank
CAR.....	Capital Adequacy Ratio
ECB.....	Ecobank Ghana Limited
EU.....	European Union
EVA.....	Economic Value Added
GCB.....	GCB Bank
GSE.....	Ghana Stock Exchange
NIM.....	Net Interest Margin
OER.....	Operating Expense Ratio
REP.....	Republic Bank
SCB.....	Standard Chartered Bank
SEC.....	Securities and Exchange Commission
SOG.....	Société Générale Ghana Limited
ROE.....	Return on Equity
ROA.....	Return on Assets
VIF.....	Variance Inflation Factor

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## CHAPTER 1: INTRODUCTION

## 1.1 Background

The financial sector is one of the most essential sectors of an economy because it stimulates the financing climate of a country. Businesses, individuals and the government use this sector to engage in a range of investing, financing, insurance and, saving activities. One sub-industry in the financial sector is the universal banking sector, which is made up of investment and commercial banking industries. Universal banks perform a wide range of services from commercial to investment banking (Brenston, 1994). With regards to their commercial banking arms, they accept deposits, offer checking account services, make business, personal & mortgage loans and offer basic financial products like savings accounts to individuals and small businesses (Kagen, 2018). On the other hand, their investment banking arms work to help companies access capital for fundraising (Kennon, 2018). This arm specializes in large and complex financial transactions, such as underwriting, facilitating mergers and other corporate reorganizations, and acting as a broker and/or financial advisor for institutional clients (Chen, 2018). Some examples of universal banks include Bank of America Merrill Lynch in the USA and Ecobank Ghana Limited in Ghana.

Universal Banks are essential in Ghana. They are integral to the growth of the banking industry in Ghana, especially because their market share and asset sizes mean they control a large number of citizens' cash. Even though they engage in both commercial and investment activities, growth of universal banks is measured looking at the individual growth of both commercial and investment banking in Ghana, thereby including them in data on the growth of the two sub-industries. For example, the Ghanaian commercial banking industry has seen an increase in total assets from GHS31 billion in 2004 to GHS110.7 billion in 2017 (BOG, 2004; BOG, 2017).

Return on equity for commercial banks decreased from 49.7 in 2001 to 18.7 in 2017 (BOG, 2004; BOG, 2017). Also, the return on assets reduced from 8.7 to 3.6 during the same period. Universal banks are included in this data because of the commercial activities they engage in. More importantly, the data shows that even though commercial banking has grown rapidly, universal and commercial banks haven't performed as well, in relation to the growth of the sector.

Although Bokpin (2015) seeks to attribute the growth in the Ghanaian financial sector in recent times to the growth in private sector commercial banking; the investment banking industry, which is still a very small sector of the economy and important in universal banks, has also been growing steadily in the past decade. The GSE market capitalization grew to GHS58,803 million in 2017 from GHS 365 million in 2000 (SEC 2001; SEC, 2018). Total assets under management by fund managers grew by 54% to GHS31 billion in 2017 from 2016 (SEC, 2016; SEC, 2018). The value of yearly trades has also increased from GHS5 million in 2000 to GHS518 million in 2017 (SEC, 2001; SEC, 2018). The GSE index has also grown steadily in the past few years. Per figure 1, the GSE Composite Index has increased from around 1,100 in January 2012 to around 2,500 in February 2019. The changes in the value have been volatile in the past decade, peaking around 750,000 in 2011 and experiencing a low of about 1,050 in the same year as seen in figure 2. This could be attributed to reforms in the past few decades and irregularities arising from the development of the exchange. This rapid growth in investments has led to increased regulation in the investment banking industry.

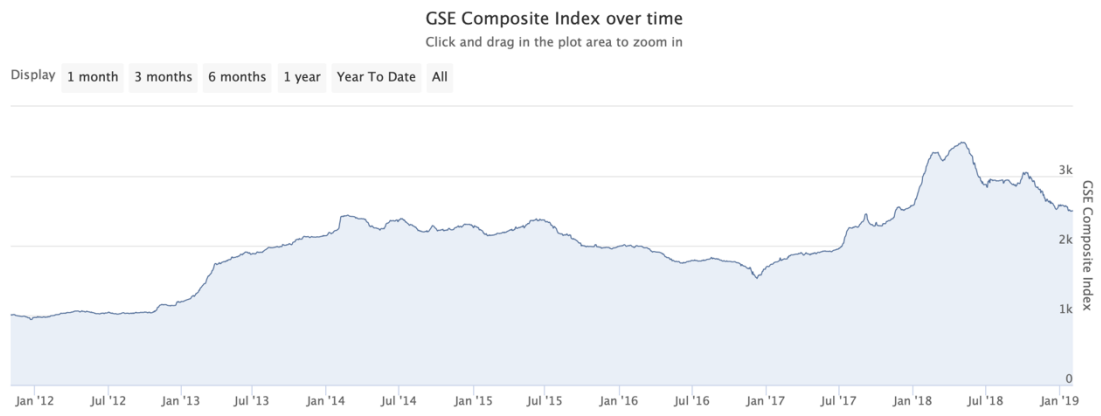


Figure 1. GSE Composite Index from 1960 – 2019

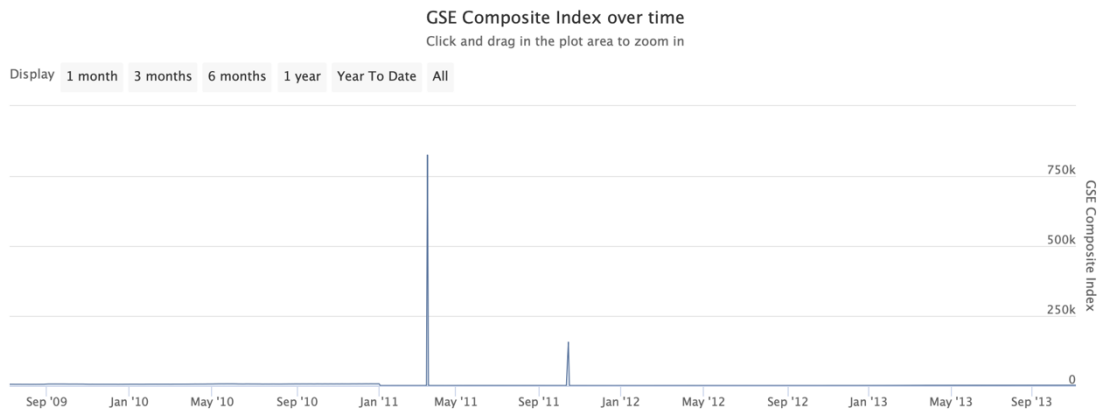


Figure 2. GSE Composite Index from Sep 2009 – Sep 2013

The banking industry has experienced major sector reforms since the 1980s which have affected its activities (Saka et al., 2012). The SEC was involved in reducing the capital requirements for investment banks to improve liquidity in the market (SEC, 2018). In addition, the commission created regulations to tackle corporate governance flaws in the sector (SEC, 2018). There has also been an increase in investment banking activities in Ghana because more players have entered the industry to take advantage of the recent interest in citizens to invest. There are seven Nigerian banks operating in Ghana, of which some are universal banks (IIAS, 2018). The growth in international business was prompted by the Economic Community of

West African States promoting inter-country business activities. Thus, new reforms have been introduced to facilitate the interconnectivity of West African stock markets. The SEC, which acts as the regulatory body in Ghana for investment banking, has also spearheaded initiatives to drive growth in investment banking. Ghana has an emerging market economy; thus, these reforms have been implemented in unique conditions because of the traits of Ghana's economy.

Ghana's emerging economy status means macroeconomic factors affect the Ghanaian economy differently when compared to the impact in the developed world. Universal banks in Ghana react to economic stimuli differently because of regulation in the country and the structure of the economy. For example, a study done on the ability of Ghanaian banks to withstand shocks to the economy discovered that banks in Ghana are more interlinked than any other region in the world. There is high dependence of Ghanaian banks on one another, showing that a shock to one bank causes a ripple effect that significantly affects other banks in the sector more than in other developing and developed countries (Aboagye & Ahenkora, 2018). This high dependence is present in most countries but is stronger in developing and emerging market countries such as Ghana. Thus, regulations in countries such as Ghana, work differently from regulations in other developing and developed countries. The SEC is an active regulatory body that tends to focus more on the growth of business activities by customers and reducing risk-taking by banks in the industry and not necessarily on the impact of regulations of the investment banks that work in the industry (Kremmling, 2011). In addition, due to the fact that the impact of these regulations on investment and commercial banking performance in Ghana is not clear, it has increased attention on the regulatory impact on commercial and investment banks in Africa. Research tends to focus on one or the other, and not the intersection of both

industries even though there is an increasing number of banks performing both activities, especially in emerging markets.

The issue of regulation in emerging markets has been of interest recently, as more studies have been carried out on the topic. Regulation in the Ghanaian banking sector has been shown to affect deposit insurance, activity restrictions, capital requirements among others (Bokpin, 2016). In 2004, a regulatory framework was setup in Ghana to monitor the whole banking sector to promote its soundness and stability (Saka et al., 2012). Regulation monitors activities in the banking sector and tracks how funds are being used in the economy. Even though regulations are similar in most countries, there are conspicuous differences in how regulation affects the banking sector in developed and developing countries such as Tunisia. Regulations in developing countries tend to be stricter than in developed countries (Evrensel, 2009). Developing countries tend to have regulations that restrict competition which could be because of the need to safeguard local businesses and lower foreign competition. However, in Ghana, the trend of creating restrictive regulations was replaced with regulations that aim to improve performance in the early part of the 21<sup>st</sup> century. Thus, the study of how regulation impacts universal banks in Ghana is what this paper seeks to showcase, in an effort to understand how the impact will play out in Ghana.

## 1.2 Problem Statement

Despite the plethora of studies on the activities of both investment and commercial banking industries in Ghana, there still remains the need to study universal banks. A study on the effects of regulation on the banking sector showed that regulations affected the banking sector differently when compared to other

countries. It focused on how developing countries have regulations that impede competition and prevent the growth of new entrants (Evrensel, 2009). However, the article failed to explain how the regulations impacted the performance of the banks in the industry. It also failed to talk about the effect on universal banks in particular. Research has focused largely on commercial banks. The scarcity of research on regulation impact on universal banking performance in Ghana is the reason this study is being conducted. Specifically, a study into how regulation has affected the performance of the universal banks in the industry and what the future holds for the banks and new entrants.

Another study looked at the efficiency of universal banks in Ghana and discovered that efficiency does not have any correlation with profitability (Adusei, 2016). The research also looked into the trend of efficiency in banks and found out that banks in Ghana had experienced a reduction in efficiency. This creates the situation where there is a need to understand how a factor such as regulation, supports or prevents universal banks from performing well even if they are efficient. There could also be a positive correlation between regulation and efficiency, as well as profitability of universal banks in Ghana. However, this kind research has not been conducted in the Ghanaian context to understand if research findings found by Adusei (2016) were impacted by regulations during the same period. This is another gap the research hopes to fill.

Lastly, significant research has been done on the impact of regulation on commercial banks, leaving room for extensive research to be done on banks that also engage in investment activities. The problem this research seeks to solve is to understand what happens to universal banks in Ghana when new regulations about their operations are put in place. Commercial and investment banks are similar on

many fronts but are governed by different regulatory bodies and laws. It is important to understand how regulation impacts profitability and efficiency of banks engaged in both activities because it determines how long these businesses can stay active. The inadequate clarity of these effects makes it difficult to assess how to improve the banking industry in Ghana and how bankers can improve their businesses. The knowledge from this research aims to help universal banks understand how to work better and influence regulation towards promoting more growth.

### 1.3 Research Relevance

In Europe and the USA, regulations seriously affect investment and commercial banks, and there is an understanding of how regulation impacts the market. However, the Ghanaian banking sector has not been studied extensively to unearth how regulation impacts the universal banks. This understanding has become necessary because universal banks such as JP Morgan & Chase which want to setup in Ghana and Bank of America Merrill Lynch and Goldman Sachs, which want to grow their African presence, require more information about the trend in returns of the Ghanaian universal banks and the impact of regulation on their performance. In an interview with Reuters in January 2018, CEO of JP Morgan Chase & Co, Jamie Dimon, announced that the firm plans to expand into Ghana and Kenya (White & Potter, 2018). He also affirmed that they have a 5-year plan laid out to invest \$20 billion in its expansion internally and externally through setting up new offices (White & Potter, 2018). This research would be of benefit to international universal banks looking to setup in Ghana or increase their existing presence in the country.

The SEC and BOG will also find this research relevant because it directly affects their day-to-day activities. A clear explanation of how regulation affects the



performance of Ghanaian universal banks will influence future regulations. For the purpose of trying to grow the industry and possibly, universal banks' performance, the SEC and BOG will look to this information for guidance on how to regulate the industry.

The research will also add to the existing knowledge about how regulations affect commercial banks in Ghana. However, it will also serve as a foundation for more research to be carried out. In studying the impact of regulation on the performance of universal banks, new issues could emerge that would require more issues about universal banking. This adds on to knowledge about Ghana's banking sectors and gives people a good view of how the Ghanaian economy, regulations and banking sector operate together.

Lastly, the research will benefit existing Ghanaian universal banks and professionals looking to set up or merge with other banks to form universal banks in Ghana. To improve performance, these banks will use information about the effect of regulation to plan operations. Also, it will give insight into how to maneuver through future regulations and adjust their business processes and activities. Professionals would also need a clear understanding about how the industry works and responds to regulation to setup companies that will thrive in the industry.

#### 1.4 Thesis Statement

Research done on both commercial and investment banks suggest that there are significant impacts of regulations on the performance of banks. Ozili (2017) found that high regulatory thresholds such as 30%, have a negative impact on the return on assets of non-listed banks. Heremes & Meesters (2015) also found that liberalization has a positive impact on efficiency. Lastly, Zgarni & Hassouna (2018) also found that

regulations such as liquidity ratio and solvency ratio are catalysts of accounting performance. Thus, the hypothesis for this research is, “Regulation positively influences the efficiency but negatively influences the profitability of Ghanaian universal banks”

### 1.5 Research Objectives

- To examine the impact of regulation on the performance of universal banks in Ghana;
- To identify significant regulatory changes in the past to analyze the impact on universal banks;
- To project the impact of possible changes in the financial regulation on the future of universal banks in Ghana after the recent Ghanaian banking crisis;

### 1.6 Research Questions

- What is the impact of regulation on the performance of universal banks in Ghana;
- What are the possible financial changes resulting from the recent Ghanaian banking crisis;
- What is the impact of possible changes in the financial regulation on the future of universal banks in Ghana;

### 1.7 Methodology

This research is explanatory because it seeks to unearth and analyze the impact of regulation on the performance of universal banks in Ghana. The research also includes panel data because it measures the performance of universal banks over a

period. The independent variables in the research are banking regulations and control variables that affect the performance of universal banks. The dependent variables are the performance metrics of universal banks in Ghana.

Data is quantitative and sourced from secondary sources only. Data gathered is used in either the measurement of the independent or dependent variables.

Data for the independent variables include; (a) capital adequacy ratio, (b) bank age, (c) total assets and (d) real GDP growth. Data for the dependent variables include operating expense ratio and return on assets.

Research is based on selected universal banks that are listed on the GSE. Information on universal banks are sourced from the companies' websites and the Annual Reports Ghana website. Regulations are also sourced from the BOG website.

### 1.8 Outline of Dissertation

The rest of the research report is organized as follows: Chapter 2 discusses the relevant literature that serve as foundation for the research. Chapter 3 details out the methodology used in gathering data on the universal banks and regulations. Chapter 4 analyzes correlations between regulations and the efficiency and profitability of the universal banks. Lastly, Chapter 5 concludes on the findings and results from the analysis to determine whether there is an impact of regulations on the efficiency and profitability of universal banks. It also includes possible future regulations and changes stemming from the recent Ghanaian banking crisis and their impact on universal banks in the future.

## CHAPTER 2- LITERATURE REVIEW

## 2.1 Introduction

This chapter explains key connections and foundational knowledge about the research topic by analyzing previous research done on universal, commercial and investment banks because of their similar structures. The literature review provides information about global banking regulation trends, the reasons for changes and studies that have explained how regulations and performance are historically related. In this chapter, five key areas and connections will be assessed; (a) The historical impact of regulation on universal banking industries in the US and UK, (b) The history of banking in Ghana, (c) the history of financial regulation in the Ghanaian banking sector, (d) The effects of regulation on commercial & universal banks, and (e) The methods of calculating efficiency of banks.

## 2.2 Historical Impact of Regulation on US and UK Universal Bank Performance

The banking industries in the US and the UK have always been highly regulated. Tough regulations date back to the early 20<sup>th</sup> century when investment banking in particular, had become more relevant to the US economy. In 1933, the Glass-Steagall Act was passed to prohibit commercial banks from participating in the investment banking business, preventing them from acting as universal banks (Klein, 2016). The act succeeded the great recession of the 1930s, to bring more security and stability to the industry. In regions like the UK, regulatory bodies such as the Financial Services Authority had also been setup to regulate banking (Bradford, 2015). Even though each region had its own regulatory bodies, global banking was affected by developments in individual regions. There have been regulations in different regions that have affected both commercial and investment banking globally because

of the interconnectivity between the industries. The most influential regulations have originated in the US since the 20<sup>th</sup> century and influenced the global banking climate.

In 1999, the Gramm-Leach-Bliley Act was enacted to give banks the ability to offer more services, and was the first major regulation after Glass-Steagall in 1933 (Investopedia, 2006). While the Glass-Steagall Act aimed at providing safer and effective use of bank assets, Gramm-Leach-Bliley tried to liberate the banking industry and is thought to be one of the causes of the 2008 financial crisis (Federal Reserve History, 1933; Klein, 2016). Thus, after the financial crisis, the Dodd-Frank Wall Street Reform and Consumer Protection Act was implemented to stabilize the industry. Dodd-Frank was enacted to prevent predatory mortgage lending by commercial banks and limit risk-taking by investment banks (Investopedia, 2010). These series of regulations were led by the US banking regulatory bodies, and other countries followed suit in the wake of these regulations coming out. As a result, there were global repercussions because of these legislations, that affected global banks.

The greatest impact to investment banks came from Dodd-Frank. According to Michaels (2015), ROE for the top 15% global investment banks averaged 6% as compared to 20% before the 2008 financial crisis. Universal banks such as JP Morgan & Chase, Deutsche Bank and Citi Bank were some that saw a drastic fall in their ROE after the crisis. Limiting risk-taking by investment banks simultaneously reduced profits and made US banks uncompetitive (Denizon, 2016). Dodd-Frank introduced regulations aimed at stabilizing investment banks and safeguarding the welfare of the everyday customer. The liquidity coverage and stable funding ratios were also introduced to ensure banks had more cash available and to encourage the use of more long-term funds (Tropeano, 2011; Klein, 2016). Dodd-Frank has been the most influential regulation in recent history, and it was an important factor in the passing of

MiFiD II. MiFiD II was a follow up to MiFiD in the EU and also restricted some of the activities that investment banks could engage in (Bradford, 2015). The strict nature of these regulations had been analyzed by finance professionals over the years, and some trends were discovered. However, with the evident effects of these regulations, Dodd-Frank, Glass-Steagall and MiFiD have received mixed reactions from finance professionals.

Gramm-Leach-Bliley has been widely blamed for the 2008 financial crisis because it is said to have over-liberated the industry, leading to high risk-taking by banks (Klein, 2016). However, some professionals believe banks would have behaved the way they did before the crisis, with or without Gramm-Leach-Bliley (Altaffer, 2015). Their argument is that banks would have taken on risky investments to remain profitable even with Glass-Steagall in effect. Proponents of Dodd-Frank said the legislation was essential because the fixed income business played a large role in the 2008 financial crisis, and the regulation was implemented to restrict the business (Michaels, 2015). Commercial banks are said to have been exposed to investment banking activities such as derivatives trading, thus the regulation was needed. However, even with the conflict of views between professionals, history and data have shown that regulatory bodies have a specific aim when introducing regulations, and these regulations have the same impact globally.

Firstly, regulatory bodies tend to safeguard the banking industry, thereby reforming the industry to stabilize it (Klein, 2016). For example, Glass, one of the leaders of the Glass-Steagall Act, wanted to direct bank credit to more productive uses such as manufacturing, commerce and agriculture (Federal Reserve History, 1933). The regulatory bodies work for the benefit of customers of the large banks. This is partly because they also guarantee bank deposits for clients (Denizon, 2016). In the

event of bankruptcy, the Federal Reserve in the US is liable to pay back some of the deposits to clients. Thus, increased regulations are not known to benefit banks.

Investopedia (2010) states that limiting risks simultaneously reduces profits. More regulations mean that investment banks are restricted to certain activities. This poses a problem to universal banks because part of their businesses thrives on the risks they take to generate returns. Deregulation produces only winners (Czyrnik & Klein, 2004). Therefore, reduced regulations in the banking industry is known to improve the performance of banks.

### 2.3 History of The Ghanaian Banking Industry

The Ghanaian banking sector is a young sector of the economy when compared to the banking sectors of countries such as the US and the UK. Banking activities in Ghana officially began in 1896 when the British Bank of West Africa opened an office in Accra (Amidu, 2007). The bank, currently known as Standard Chartered Bank (Ghana) Limited, provided primary banking services to Ghanaians. This gave Ghanaians their first interaction with the banking sector, and the first instance of banking activities occurring in the country.

The banking sector was originally segmented into merchant, commercial (retail) and development banks when it started (Amidu & Hinson, 2006). The segmentation of banks into these categories introduced the importance of bank specialization in Ghana; the concept through which banks would focus on some specific areas of banking. By 1990, the formal banking system comprised of the central bank, four commercial banks and three development banks (Ayeertey, 1996). These numbers increased in 1993 to three commercial, seven secondary, 300 credit unions and 120 small rural banks operating in Ghana (Bhatt, 1993). By 2006, five

merchant banks were operating in Ghana (Yartey, 2006). Merchant and investment banks have increased in Ghana since the inception of the banking sectors. Notable names such as Universal Merchant Bank, Databank Limited, Ecobank Capital and IC Securities are some of the major players that operate in Ghana. The advent of these banks could be attributed to increasing financial knowledge of Ghanaians and the interest in saving and investing. As a result of increased demand by Ghanaians, the banking sector reached saturation in 2016, with 27 banks operating as commercial and some as universal banks (Bokpin, 2016). However, the Ghanaian banking crisis in 2018, led to the consolidation of five banks and the acquisition of two other banks in the commercial banking sector (Adombila, 2018). Some of the newly created universal banks included Republic Bank. The banking industry has also experienced significant changes in its recent history because of reforms and times of depression.

The Ghanaian banking sector has experienced major dips since inception. In the early 1980s, Ghana experienced the sharpest economic decline and fall in living standards, as the broad financial sector took a huge blow (Bhatt, 1993). Even though the commercial banking industry experienced dips in growth and performance, the investment banking industry, which was not well-established during the period, didn't experience a significant dip in performance. This dip affected the economy and triggered reforms that aimed at improving the sector. Ayeertey (1996) agrees in his article that such reforms were meant to enhance regulatory and supervisory functions to ensure the prudence of financial institutions. As part of the process, the Bank of Ghana rationalized the minimum reserve requirements for banks, introduced new financial instruments, and open market operations for liquidity management for commercial banks (Egu, 2009). The government also launched the Financial Sector Adjustment Programme (FINSAP) to address the deterioration problems in the



financial sector (Ayeertey, 1996). The importance of (FINSAP) is echoed in GIPC's article about "Investing in Ghana's Financial Service Sector."

#### 2.4 Financial Regulation in Ghana

Financial regulation has changed over the years in Ghana. Research has been carried out to understand the basic processes involved in enforcing regulation in Ghana and how these processes have changed since the regulatory bodies were setup.

The source of statutory rules that regulate commercial activities in Ghana is the Bank of Ghana (Amendment) Act 1965. The SEC regulates the securities market and investment activities, as stated in the Securities Industry Act 2016 (SEC, 2016). These bodies stipulate the manner in which banks operating in Ghana should run in terms of management, capital base etc. They are given authority to operate by the constitution and work to safeguard the banking industry and market. They were setup to stabilize the market and to ensure that the sector works efficiently. They have done this by introducing regulations to improve the sanctity of both commercial and investment banking industries.

One key aspect of the regulation that has been introduced by the BOG is the minimum capital requirement that banks must have to operate. The regulation was stated at GHS7 million in 2004, changed to GHS60 million in 2008 and has been revised to GHS120 million in 2013 (BOG, 2004; BOG, 2017). Out of all the banks operating in Ghana, the National Investment Bank and Africa Development Bank are the only two banks exempted from the minimal capital requirement (PWC, 2014). This could be because of their importance in stimulating the Ghanaian economy through development programs and investing in private and public projects. Another

key regulation is the minimum capital adequacy. It is a percentage of the adjusted capital base of the bank to its adjusted asset base (BOG, 2004). It currently stands at 10% and hasn't been revised since 2004. The SEC also has some regulations that govern investment banking. Some of these regulations include paid up capital; the minimum reserves the bank must have to remain in operation. One important regulation is the paid-up capital which stood at GHS100,000 in 2003 and poised to be increased to GHS1.5 million in 2019 (SEC, 2003; SEC, 2018). Other regulations include the liquid capital and liquid funds aimed at promoting liquidity in the industry. Regulations in Ghana tend to be stricter and include bureaucratic processes used in promoting transparency.

Regulations in Ghana require that banks follow certain processes when making changes to company structure. For example, any alterations in commercial banks' regulations have to be communicated by the BOG at least three months before they are implemented (Date-Bah, 1975). The same article also mentions that monthly returns of banks must be submitted by close of the last working day in each month. The SEC also states that firms are expected to replenish funds within three days if funds fall below the minimum capital requirement (SEC, 2003). Research conducted proved that developing countries have stricter banking regulations and are more likely to reduce competition (Evrensel, 2009). This makes the sector more rigid, leading to emphasis on making banks safer than profitable. However, this finding can be argued on the basis that developed countries are in dire need of improved financial sectors so increased regulation is counterproductive. These financial sectors are weaker than in developed countries, so need to be nurtured for growth. Financial systems in countries are inherently fragile and this could explain the stress of securing the sector in developing countries (Bhatt, 1993).

### 2.5 Regulation Impact on Commercial and Universal Banks

The impact of regulation on the performance of banks has both theoretical and empirical evidence. The theory of regulation and its impact on the performance explains some, but not all results that are witnessed in the real world. This is partly because of the two types of regulations that exist; micro-prudential and macro-prudential. Micro-prudential regulation concerns itself with the stability of each individual institution in the banking industry while macro-prudential regulation concerns itself with the stability of the financial system as a whole (Brunnermeier et al., 2009). While it would be ideal to combine the two types of regulation in supervising the banking industries in the world, regulators have found it difficult to do so. As a result, different regulations have different effects on the performance of banks. The theoretical understanding of the impact of regulation shows that while micro-prudential regulation acts based on exogenous risks of individual banks, macro-prudential regulation uses internal factors as a basis for implementation (Brunnermeier et al., 2009). This makes the theory of regulation distorted, therefore making it difficult to understand impact. However, one clear aspect about the theory of regulation is that it shows the direction in which regulations act.

The theory of regulation states that regulation is procyclical. This means that regulations are enacted after recessions and drops in economic productivity (Cao, 2016). Thus, regulations do not supersede economic downturns. They are enacted to correct problems in the economic cycle of the banking industry and economy. However, they should be more countercyclical so they can prevent future mistakes in the economic and banking systems. Empirical evidence of the study of the impact of regulation on the performance of banks will show that research tends to occur after countries have gone through recessions or financial crises.

Developed and some developing countries have unearthed how regulation affects the performance and behavior of their banking sectors. The research has been done on the impact in Africa, showing differences in impact when compared to developed countries.

The GSE's exposure is limited to international events such as the financial crisis (Gockel, 2010). And in recent years, emerging markets like Ghana have also experienced growth in their stock markets (Yartey, 2006). This has increased focus and led to more regulation to safeguard the banking sectors. As a result, the anomalies in how banking sectors operate in developing and emerging markets have increased the relevance of conducting research to understand the behaviour of these markets. It was relevant to understand the impact on banks, especially commercial banks. The studies on the soundness of these policies have shown that they have both positive and negative impacts on the banks' performance.

Ozili (2017) conducted research on the impact of capital regulation on the profitability of African banks. He researched on both listed and non-listed banks and found that capital regulation has a positive impact on return on assets of banks. Other research showed the effect of deregulation. A study done on the impact of deregulation on banks in India found that deregulation reduced profit performance (Sensarma, 2008). Hermes & Meesters (2015) also conducted research on the impact of financial liberalization on bank efficiency. They studied 87,312 bank observations from 61 developing and emerging economies from 1996 to 2005. The research showed that financial liberalization is positively associated with increased bank efficiency. Findings from both Ozili (2017) and Sensarma (2008) showed that capital regulation is positively associated with the profitability of banks. Hermes & Meesters also found the opposite when studying regulation and efficiency. Even with the

soundness of the findings, other articles show that there are situations when the impact of these regulations are different.

Sum (2015) studied the effect of regulation on bank performance in the EU. The research showed that high capital requirements is positively correlated with bank value. However, the results also showed that every bank had an optimal capital requirement, thus, regulations involving high capital requirements reduced bank value. Since high capital requirements encourage banks to engage in safe investment activities, overly high requirements could force them to engage in riskier activities, causing the fall in value. Setting capital requirements at a moderate level encourages banks to use funds more efficiently. These results were in direct opposition to results from research done by Sensarma (2008).

Lastly, Zgarni & Hassouna (2018) conducted research on regulation and bank performance of Tunisian banks. This represents research done on developing countries to supplement knowledge from research done in developed countries. The research included 160 observations over a 16-year period. The research found that liquidity and solvency ratios are catalysts for accounting performance in Tunisian banks. This is in direct opposition to Ozili (2017) and Sensarma (2008).

The literature has conflicting results on the effects of regulations on efficiency and profitability. However, there are some explanations for the positive impact of regulation on efficiency. Increased regulation includes increased insurance against the deposits collected by banks (Bokpin, 2016). Thus, higher deposit reserves prevent commercial banks from generating more revenue from issuing loans and earning interest and encouraging banks to be more efficient. With regards to profitability, the explanations for the negative relationship with regulations also exist. Regulations such as capital adequacy ratio tend to stiffen profitability. In 1988, capital adequacy

ratio was increased from 5% to 6% to tighten risk exposure (Bhatt, 1993). Banks recorded lower profitability levels after, even though there was no clear correlation between the two variables. Bank reserves to deposits ratio rose to 59% and no interest was paid on these deposits, leading to the banks' profitability decline (Bhatt, 1993). Essentially, tighter restriction has a positive effect on efficiency, which could lead to higher value (Eken et al., 2015). However, the breadth of research shows that regulation impacts banks differently across different countries.

## 2.6 Measuring Performance of Banks

Efficiency and profitability of banks can be measured using different techniques. Research shows that different techniques differ based on method and intended use of end result. Also, research shows that accuracy also differs between techniques, giving rise to the need to select an appropriate avenue.

One metric of determining bank efficiency is the concept of technical efficiency. Technical efficiency is the ability of a firm to transform a given amount of input into the maximum level of output or minimize input to obtain a given amount of output (Adusei, 2016). It measures the amount of return that a given amount of resources can generate when employed. This concept is translated to how deposits and cash reserves of banks are used to generate returns for the bank's balance sheet. The output orientation refers to the gains from using inputs and a firm is considered to have technical efficiency if it maximizes its output with a given amount of input. Technical efficiency is influenced by other factors such as corporate governance and ownership of banks. Adusei (2016) and Saka et al. (2012) used this metric in conducting their research.

Another efficiency metric that has been developed to measure bank performance is EVA. It was a measure adopted to improve the way companies could evaluate everything from business strategies to the relative performance of divisions (Heffernan & Fu, 2010). It is calculated by finding the difference between operating profits and capital charge, and dividing the difference by factor inputs of the bank (Heffernan & Fu, 2010).

Profitability metrics used in measuring bank performance have remained unchanged. The most common metrics are ROE, ROA and NIM. ROE and ROA measure the return on equity and assets respectively (Ozili, 2017; Shen et al. 2009; Heffernan & Fu, 2010). NIM is also a measure of profitability that is calculated by dividing a bank's net interest income by average earnings assets (Heffernan & Fu, 2010). It measures a bank's interest spread. This is a profitability metric because the larger the credit spread of a bank, the higher its revenue and vice versa. NIM shows the growth in revenue caused by growth in the credit spread of the bank.

Items from banks' balance sheets are the main data variables used in measuring performance. Items such as ROA, NIM and ROE have inputs from either the income statement or balance sheet or both. These can be referred to as accounting performance metrics because they solely rely on data from income statements and require no further alterations.

The measurement of bank performance could be for efficiency, profitability, customer service etc. As a result, researchers need to select relevant metrics when calculating the performance of banks. Based on the intended purpose of the research, specific metrics need to be used to assess banks. Reviewed literature has shown that for accurate results, it is recommended that researchers make use of as many metrics and conduct robustness tests to test for the validity of results. Ho (2006) stated that to

get accurate information on bank performance, specific indicators about the performance metric being studied should be procured. It prevents waste of resources and encourages justifiable results from research.



## CHAPTER 3- METHODOLOGY

## 3.1 Introduction

The purpose of this research is to examine the impact of regulation on the performance of universal banks in Ghana. Research has been carried out in the US, Canada, Europe and Asia; however, it is not certain that the impact of regulation in these regions is applicable in Ghana. Chapter 2 showed that the basis of regulation in developing and developed countries have clear differences, resulting in different conditions in these regions when compared to Ghana. This chapter presents the research methods, data collection, data analysis and limitations of the research.

## 3.2 Research Design

This research is quantitative because it makes use of statistical data and mathematical techniques to unearth the impact of regulation on the performance of universal banks in Ghana. The variables in the research are quantitative and will require quantitative data from the regulatory bodies and the universal banks being studied. A correlational approach or regression model is used to find the relation between the two factors; (a) regulations and (b) performance metrics. This approach has been used by Ozili (2016) and Saeed (2014) in their research. The quantitative data is used in the models to find the connection, if there is, between regulations and the performance metrics of the universal banks.

The research is explanatory because it seeks to find the impact of regulation on the efficiency and profitability of universal banks in Ghana. In this study, regulations are the independent variables and performance metrics of the universal banks are the dependent variables. The research is also a longitudinal study because the data spans for a period of 13 years. Research done by Saona & Azad (2018)

and Sensarma (2008) to study performance of banks also involved longitudinal research. The period size for study ranges from 6 - 17 years based on the reviewed literature, thus the use of a 13-year period.

### 3.3 Hypothesis

The study seeks to unearth the impact of regulation on the performance of universal banks in Ghana. The gap this research aims to fill is the inadequate research done on regulation and universal banks in Ghana. Chapter 2 showed that extensive research has been done on the history of universal, commercial and investment banks in much of the developed world. Research has also been done on the impact of regulation on commercial and universal banks globally. Thus, the research will aid in supplementing what is already known about universal banks in Ghana, to give a better understanding of the impact of regulation on the banking sector.

Previous research showed that regulation has significant impact on banks. Sum (2015) studied the effect of banking regulation on banks in the EU and results showed that increased capital requirements is positively linked with bank value. Capital requirements prevent risk-taking, thereby reducing profitability, since more funds are available but not used to generate revenue. Also, activity restrictions in regulations positively affect bank stability (Sum, 2015). Restricting banks from certain activities will reduce their risk exposure and improve soundness. It will increase efficiency but can reduce profitability.

Another study looked at how nationalization of banks would affect the performance of the banks. Zgarni et al. (2018) study showed that nationalization of banks is negatively correlated with banking sector growth and performance of banks. Thus, the greater the government intervention in the financial sector, the lower the

performance. Ozili (2017) found that high regulatory thresholds have a negative impact on the return on assets of non-listed banks but are beneficial if they are moderate. Heremes & Meesters (2015) also found that liberalization has a positive impact on efficiency. Based on previous research done on other developing countries and emerging markets, the hypotheses are defined below:

- H0: Increased regulation positively influences the efficiency profitability of Ghanaian universal banks;
- H1: Increased regulation negatively influences the efficiency and profitability of Ghanaian universal banks;

### 3.4 Population and Sampling Method

The population for this research is universal banks operating in Ghana. There are 23 universal banks currently operating in Ghana (Odame-Gyenti, 2019). These banks offer indirect investing opportunities for clients through their brokerage arms that provide access to tradeable securities. In addition, some of the banks engage in added investment banking services such as asset management and M&A advisory services. Due to the need for available data, the universal banks selected for the study are publicly-listed. Thus, the sample for the research is publicly-listed universal banks operating in Ghana. These are universal banks that have received licensing to operate in Ghana from the SEC and are listed on the GSE. There are eight universal banks listed on the GSE and they are (a) Access Bank Ghana, (b) CAL Bank Limited, (c) Ecobank Ghana Limited, (d) GCB Bank Limited, (e) Republic Bank Ghana Limited, (f) Agricultural Development Bank, (g) Standard Chartered Bank Ghana Limited and (h) Société Générale Ghana Limited. However, because of lack of available data for the research, Access Bank Ghana and Agricultural Development Bank will not be

included in the research. Thus, the sample for the research represent 32% of the total population of universal banks in existence during the period being studied.

Publicly-listed firms are being used for the research because of the availability of data on their performance over the years. The availability of financial data on the banks affects the chose sample size for the research. Thus, the sampling method used for this research is non-random sampling because participants are selected based on characteristics they possess or their availability to participate (Vanderstoep & Johnston, 2009).

### 3.5 Data and Data Sources

The data used for the research is secondary data. Data on performance metrics is collected from financial statements of the selected banks. The financial statements are collected from the SEC website, annual reports websites and the GSE website.

The data include the following:

1. Net Income;
2. Total Assets;
3. Operating Expense;
4. Gross Operating Income;
5. Capital Adequacy Ratio;

Data about regulatory changes are also secondary data. Data will be collected from the BOG website. The data will be capital adequacy ratio.

### 3.6 Data Analysis Tools

Research done on the impact of regulation on performance of commercial, investment and universal banks has made use of various models. In analyzing the

performance of banks, studies have divided efficiency and profitability metrics. In understanding the effect on efficiency, studies used operating expense ratio because of its ability to measure how efficient banks are at managing cost when generating revenue (Mykhayliv & Zauner, 2018; Shen et al., 2009). Mykhayliv & Zauner (2018) also made use of the overhead ratio to find efficiency of banks, looking at how well indirect expenses are covered by profits. Other studies also made use of Cost to Income ratio; the ratio of operating costs to income generated (Shen et al., 2009; Heffernan & Fu, 2010).

Measuring profitability of banks tends to be a more popular method of determining bank performance. ROA has been used as a profitability metric and has been cited in numerous studies (Shen et al., 2009; Heffernan & Fu, 2010). It shows the returns banks are able to generate on their assets, giving a view of how profitable they are. Another profitability metric is the ROE, which has the ROA as a component of its calculation (Heffernan & Fu, 2010; Kremmling, 2011). It is a key metric for shareholders of banks because it is a gauge of how profitable ownership in banks are for investors. NIM, which is a measure of the credit spread earned by banks has been frequently used in existing literature such as in Nshimiyimana & Zubeda (2017) and Heffernan & Fu (2010). It would be optimal to compare the impact of regulation on different profitability and efficiency metrics; however, time constraints limit the research to one profitability metric and one efficiency metric. Thus, the metrics chosen for the research are OER and ROA.

Based on the performance metrics chosen, two regression models are used to measure the impact of regulation on the performance of universal banks. One regression model measures the impact of regulation on efficiency and the other model

measure the impact of regulation on profitability. R Studio is used to run the regression for the study.

### 3.7 Regression Models

Measuring the impact of regulation on the performance of banks has been done using different models from the existing literature. Zgarni & Hassouna (2018) studied regulation and performance by using a multiple linear regression model. The model measured the relationship between the dependent variable ROA, and independent variables; solvency ratio and liquidity ratio. Sum (2015) used a similar model to estimate the effect of regulation on the stability (Z-score) of banks. The model adopted was the DEA Model. This model is an analysis based on the relative evaluation of the efficiency in input=output situations, by taking into account each bank and measuring its relative efficiency to an envelopment surface made up of the best bank practices (Sum, 20015). The model was used to determine TE of the selected banks. It was a useful model because it measured the performance of banks against 'best practices', thereby comparing them to an expected standard performance that cut across all banks.

Hermes and Meesters (2015) used a stochastic frontier analysis for their study because it controls for measurement errors and other random effects. They studied the impact of regulation and financial liberalization on cost efficiency of banks, thus the use of the stochastic frontier analysis. The analysis estimates an efficient cost frontier and an equation measuring the inefficiencies to study the cost efficiency (Hermes & Meesters, 2015). This is an advanced model that has the ability of taking care of unknown factors that affect the dependent variable, giving it an advantage over the DEA model.

Apart from Hermes and Meesters (2015), another study by Sensarma (2008) found the determinants of bank profitability by using the Stochastic frontier analysis. This model was good in finding out what determines the profitability of banks. However, the Stochastic model isn't an explanatory model, but an exploratory model, making it difficult to implement in this explanatory research. As a result, the best model for this research will be a multiple linear regression model. The multiple linear regression model tends to be more appropriate for y variables dependent on more than one x variable and can be used for explanatory research.

This research is explanatory and longitudinal in nature. Thus, a multiple linear regression using panel data analysis will be adopted. Panel data analysis allows for the analysis of cross-sectional and time data (Wooldridge, 2012). The panel data analysis is an extension of the multiple linear regression to accommodate varied groups in the data. It is used to control other variables that can affect the independent variable. Heffernan & Fu (2010), Saeed (2014) and Nshimiyimana & Zubeda (2017) used panel data in their research to study regulation and bank performance. Thus, per the literature, an adjusted panel data method is used to calculate the impact of regulation on the performance of universal banks in Ghana.

The panel data analysis will require the use of either a fixed or random effects model. The fixed effects model identifies a relationship between the explanatory variables and the dependent variables of the entities being studied. This is because of a factor specific to each entity that affects the dependent variable of the entity (Torres-Reyna, 2007). On the other hand, the random effects model assumes that there are no correlations and the errors are random, thus, do not need to be controlled (Torres-Reyna, 2007). One of the two models is chosen using the Hausman Test.

The Hausman Test tests for whether the analysis should use a fixed or random effects model. The null hypothesis of the test states that the best model is one that uses random effects while the alternate hypothesis is that the best model is a fixed effects model. After testing, the values shown determine whether the variables are correlated. If they are correlated, a fixed effects model is used but if they are not correlated, the random effects model is used.

### *3.7.1 Efficiency Model*

The first regression model finds the effect of regulations on the efficiency of the universal banks:

**Performance = f (Regulatory ratios, Control variables)**

$$\text{OER}_{it} = \beta_0 + \beta_1 \text{CAR}_{it} + \beta_2 \text{TA}_{it} + \beta_3 \text{A}_{it} + \beta_4 \text{GDP}_t + e_{it}$$

Where,

OER = Operating expense ratio

$\alpha$  = Y-intercept

$\beta_{0-4}$  = Co-efficient of variable

CAR = Capital Adequacy Ratio

TA = log (Total Assets)

A = log (Age)

GDP = Real GDP growth

i = Universal bank

t = Year

e = Error term

Per the model, the efficiency of the universal banks is given as a function of the regulations and control variables. The y-intercept represents the value of the



dependent variable if all independent variables are 0. The study of how regulations impact the performance of universal banks is the reason why CAR is included in the model. These are regulations that are hypothesized to impact the operating expense ratio of universal banks. Bokpin (2015) and Ozili (2016) included the log of total assets in their models in determining the efficiency of banks. Zgarni & Hassouna (2018) also included age as a control variable. Thus, total assets and age have been introduced as control variables in the model. Lastly, Heffernan & Fu (2010), Nshimiyimana & Zubeda (2017) and Ozili (2016) used the macroeconomic factor, GDP growth, as a control variable, thus it's inclusion in the model.

### 3.7.2 Profitability Model

The second regression model finds the effect of regulations on the profitability of the investment banks:

**Performance = f (Regulatory ratios, Control variables)**

$$ROA_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 TA_{it} + \beta_3 A_{it} + \beta_4 GDP_t + e_{it}$$

Where,

ROA = Return on Assets

$\alpha$  = Y-intercept

$\beta_{0-4}$  = Co-efficient of variable

CAR = Capital Adequacy Ratio

TA = log (Total Assets)

GDP = Real GDP growth

i = Universal bank

t = Year

A = log (Age)

e = Error term

This model is similar to the efficiency model. The difference is the use of the dependent variable, ROA, instead of the OER. The same regulations and control variables in the efficiency model have been included in this model.

### 3.8 Variables

#### *3.8.1 ROA*

ROA is the return on assets of a firm, and it is an indicator of how profitable a firm is relative to its assets (Momoh, 2003). It is a good gauge of how well managers in a firm are making use of assets to generate returns for the firm. It is measured as a percentage and is calculated by dividing Net Income by Total Assets. Firms with higher ROAs are said to be more profitable because they generate more net income with the limited amount of assets

#### *3.8.2 Operating Expense Ratio*

The operating expense ratio (OER) is a measure of what it costs to operate a piece of property, compared to the income that the property brings in (Investopedia, 2010). It is calculated by dividing the firm's operating expense by its gross operating income. It measures the efficiency of a firm by comparing expenses to income. Firms with lower operating expense ratio tend to be more efficient.

#### *3.8.3 Capital Adequacy Ratio*

CAR is a measurement of a bank's available capital expressed as a percentage of a bank's risk-weighted credit exposures (Hayes, 2019). It is calculated by finding the sum of a bank's Tier 1 and Tier 2 Capital and dividing the value by the risk

weighted assets of the bank. The regulation in Ghana states that every bank must have a minimum CAR of 10% and can include a buffer of 3% (BOG 2004; BOG 2017).

### 3.9 Limitations

The first limitation of the methodology is the possible inadequacy of the models used. There are numerous factors affecting the performance of investment banks that cannot be catered for in the models. The constant is only an estimate of other variables affecting the dependent variable. Thus, the results of the regression model might not be a true representation of the other factors affecting performance.

Some of the universal banks involved in this study engage in commercial and investment banking in different proportions. Thus, the existence of these discrepancies could skew the results of the analysis.

Some universal banks don't have all results for the period of analysis. Some of the universal banks are not listed, thus, their information is not available. Also, only six listed universal banks in Ghana are used in the research because some do not have enough data available.

Important regulations that could affect the performance of the universal banks were not changed during the period being studied so were not included in the model. This prevents the model from being comprehensive enough to estimate the impact of regulations on performance of universal banks. It would be useful to include liquidity ratio and unsecured credit limit exposure as regulations in the model.

## CHAPTER 4- RESULTS

## 4.1 Introduction

This chapter examines the impact of banking sector regulations on the performance of the selected universal banks for the research. The trends in total assets, ROA, and operating expense ratio over the past 13 years are studied in this chapter. In addition, descriptive statistics on the data are analyzed to give a better understanding of the climate during the years under study. Lastly, the regression analysis is conducted to identify the correlation, if any, between banking sector regulation and universal banks' performance.

## 4.2 Trend Analysis

## 4.2.1 ROA

The ROA of the six universal banks over the past 13 years is seen in Table 1. The highest ROA value within the period was 6.96% and it was recorded by Standard Chartered Bank in 2013. The lowest ROA within the period was -2.52% and it was recorded by Republic Bank in 2016. Thus, the range (the difference between the highest and lowest values in the table) is 9.48%.

Table 1

*Return of Assets of Universal Banks From 2005 – 2017*

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
<b>CAL</b>	2.75%	2.99%	2.74%	2.68%	1.83%	1.86%	2.09%	4.45%	5.98%	5.27%	4.94%	0.30%	3.62%
<b>ECB</b>	3.74%	3.83%	3.34%	3.65%	3.88%	3.95%	3.39%	3.87%	4.06%	5.55%	4.80%	4.07%	2.79%
<b>GCB</b>	2.19%	3.34%	2.85%	2.28%	0.98%	2.44%	0.73%	4.80%	6.73%	6.62%	5.45%	5.24%	2.44%
<b>REP</b>	1.16%	1.18%	1.30%	1.61%	2.21%	2.37%	2.49%	2.59%	3.98%	4.31%	-2.27%	-2.52%	1.76%
<b>SOG</b>	2.72%	2.72%	2.77%	3.55%	3.35%	2.82%	2.72%	2.78%	2.99%	2.97%	2.23%	2.61%	3.24%
<b>SCB</b>	4.51%	4.32%	4.09%	3.37%	4.09%	4.33%	3.94%	5.70%	6.96%	5.94%	1.96%	5.13%	5.94%

In Figure 3, the mean and median of the ROA of the universal banks are shown. The mean and median ROA values reduced slightly from 2005 to 2011 before

jumping to record highs from 2013 to 2014 and falling to lows in 2015 and 2016. The period of lows preceded the Ghana banking crisis. The periods of highs also succeeded Ghana's first oil drill (Dogbevi, 2016). The universal banks recorded their largest mean ROA of 5.12% in 2013 and their largest median ROA of 5.41% in 2014. The lowest mean ROA was recorded as 2.47% in 2016 and the lowest median was recorded as 2.61% in 2011. The mean and median values follow a similar trend because the variations in the data values are not large enough to skew the data summary.

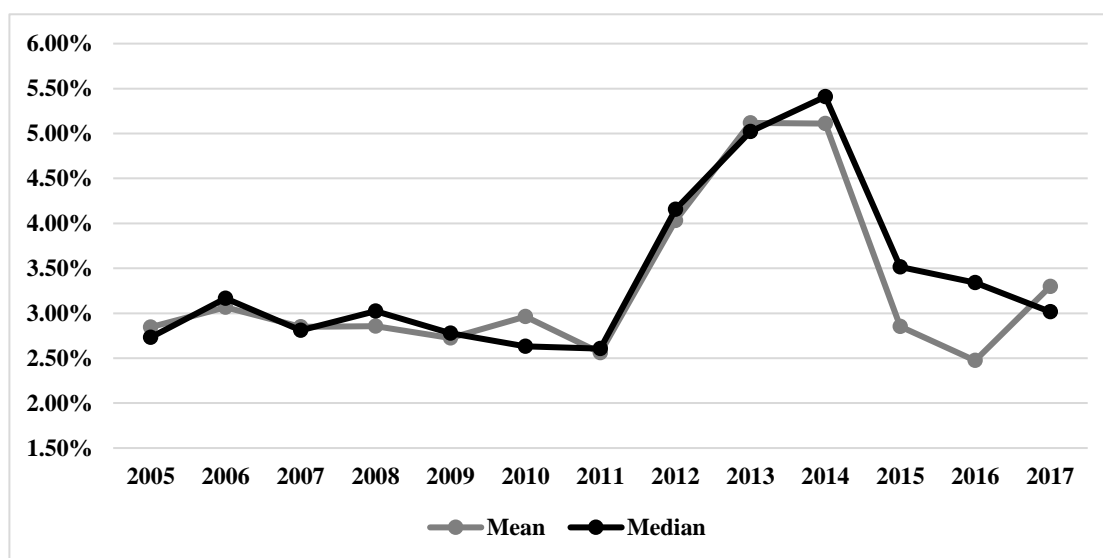


Figure 3. Mean and Median ROA of Universal Banks from 2005 - 2017

#### 4.2.2 Operating Expense Ratio

The OER of the universal banks can be seen in Table 2. In 2016, Republic Bank recorded the highest OER within the period as 131.64%. The lowest value of 30.8% was recorded by Standard Chartered Bank in 2013. Unlike the ROA, the range between the highest and lowest OER during the period is large. The value is 100.83% and suggests that there are large variances between the data values.

Table 2

*Operating Expense Ratio of Universal Banks from 2005 – 2017*

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
CAL	53.39%	48.57%	60.30%	63.01%	64.83%	52.64%	50.93%	36.68%	33.80%	32.64%	35.92%	41.09%	40.76%
ECB	48.15%	50.46%	51.45%	53.65%	48.58%	46.48%	52.50%	50.03%	45.28%	44.24%	43.96%	60.62%	67.98%
GCB	76.91%	67.41%	67.79%	63.75%	69.56%	58.03%	87.04%	52.92%	47.67%	58.57%	59.83%	57.39%	67.34%
REP	83.06%	73.55%	73.82%	70.34%	75.52%	70.37%	75.05%	67.23%	52.80%	57.11%	125.78%	131.64%	74.54%
SOG	64.85%	62.05%	63.64%	60.39%	63.37%	65.55%	68.49%	63.79%	59.90%	54.86%	62.20%	72.02%	76.53%
SCB	46.03%	46.80%	51.51%	61.11%	45.87%	47.21%	43.00%	37.22%	30.80%	37.91%	42.79%	31.27%	36.20%

The mean and median OER values of the universal banks are also shown in Figure 4. The lowest mean OER was recorded in 2013 as 45.04% and the highest was recorded as 65.67% in 2016. The highest median value was recorded in 2017 as 67.66% while the lowest was recorded as 46.48% in 2013. The trends in the mean and median values are similar from 2005 to 2014 but separate largely from 2014 to 2017. This is because of the presence of large variances in the data values in 2015 and 2016.

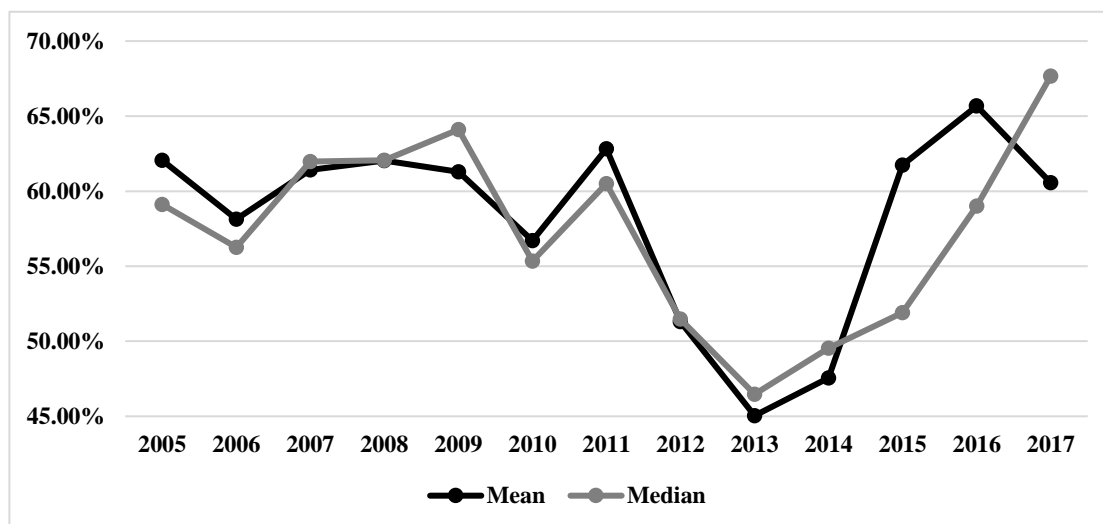


Figure 4. Mean and Median OER of Universal Banks from 2005 - 2017

*4.2.3 Universal Banks' Total Assets*

The mean and median total assets of the universal banks within the period is seen in Figure 5. The total assets of the universal banks increased steadily during the

period. The lowest mean and median values were recorded as GHS322 million and GHS330 million respectively in 2005. The highest mean and median values were also recorded as GHS5.435 billion and GHS 4.5 billion respectively in 2017.

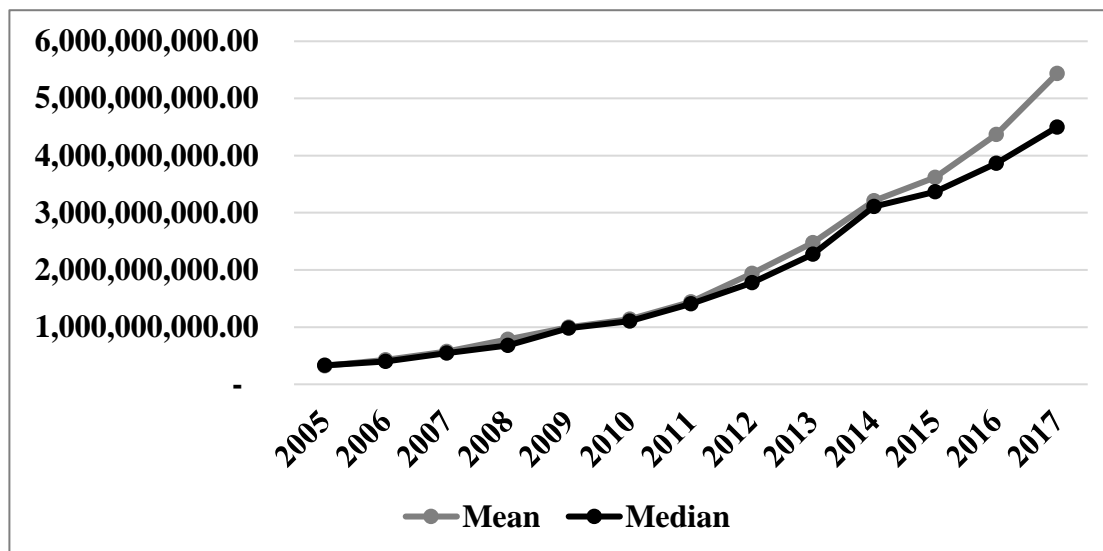


Figure 5. Mean and Median of Total Assets of Universal Banks from 2005 - 2017

#### 4.2.4 Real GDP Growth

The real GDP growth of Ghana, which shows the growth of the economy after catering for inflation, fluctuated largely during the period. The real GDP growth increased to its highest value of 14.05% in 2011 and continued to drop to its lowest value of 2.18% before rising again. This fluctuation in the growth was influenced by many factors that were prevalent during the period. The Ghana Cedi experienced depreciated drastically during the period, and other macroeconomic factors such as inflation and unemployment rate hurt business and consumer spending.

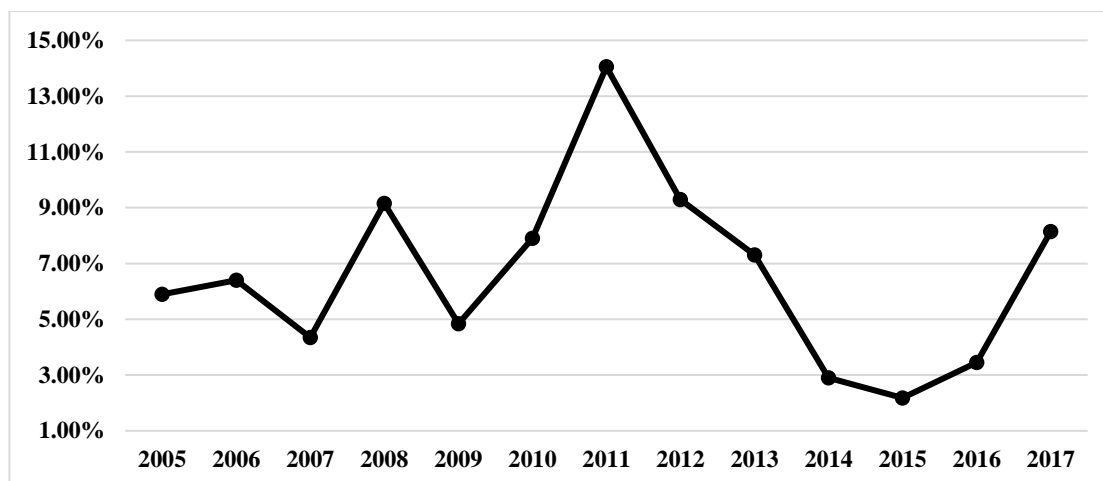


Figure 6. Ghana Real GDP Growth from 2005 - 2017

#### 4.2.5 Capital Adequacy Ratio

The mean and median CAR values of the universal banks are also shown in Figure 7. The lowest mean CAR was recorded in 2007 as 14.09% and the highest was recorded as 23.70% in 2017. The highest median value was recorded in 2017 as 23.05% while the lowest was recorded as 14.41% in 2008. The trends in the mean and median values are similar from 2005 to 2010 but separate largely into the latter part of the period under study. This is a result of the larger variances in values from 2009 to 2015.

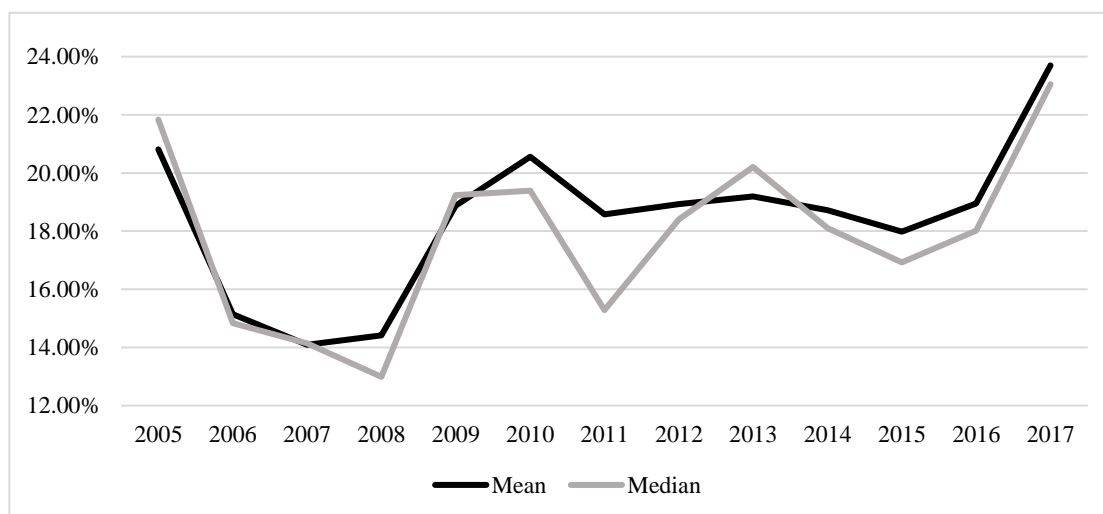


Figure 7. Mean and Median CAR of Universal Banks from 2005 - 2017



## 4.4 Regression Analysis

## 4.4.1 Summary of Panel Data

Table 3

*Descriptive Statistics of Panel Data*

<b>Variable</b>	<b>Standard Deviation</b>	<b>Median</b>	<b>Mean</b>	<b>Variance</b>	<b>Count</b>
TA	0.49	9.15	9.09	0.24	78
Age	0.40	1.44	1.47	0.16	78
ROA	0.02	0.03	0.03	0.00	78
OER	0.17	0.58	0.58	0.03	78
CAR	0.06	0.17	0.18	0.00	78
GDP	0.03	0.06	0.07	0.23	78

The summary statistics of Total Assets, Age, Return on Assets, Operating Expense Ratio, Capital Adequacy Ratio and Real GDP Growth were generated to give a better understanding of the data variables. There were 78 observations for each variable during the period of the study.

Per table 3, Total Assets and Age recorded standard deviations greater than 0.4, but less than 0.5. Thus, the variation and dispersion of the data values is not large because there aren't outliers in the data. This level of variation is also seen in the variance of the variables. The variances are low for all the data variables, showing a low expectation of the squared deviation of the data values from their mean. CAR also had a low standard deviation of 0.06, showing low variations in the data values.

During the period, total assets of the banks gradually increased, thus the high median and mean total asset values. ROA, CAR and OER median and mean values are also close because of the small range of values recorded in the data. Real GDP growth also averaged 0.07 during the period.

#### 4.4.2 Zero Conditional Mean

Table 4

##### *Values of Error Terms*

	<b>Error Term</b>
<b>Efficiency Model</b>	-6.707306e-20
<b>Profitability Model</b>	3.331489e-18

The error term in the models are assumed to have a value of zero given any values of the independent variables (Wooldridge, 2012). This test is important because it determines whether an OLS regression can be used for the analysis. Per table 4, the error terms in each model have values that are approximately zero. This means that the OLS regression is a good tool to measure the relationship between the regulations and the performance metrics.

#### 4.4.3 Multicollinearity Test

Table 5

##### *Correlation Matrix of Independent Variables*

	<b>TA</b>	<b>Age</b>	<b>CAR</b>	<b>GDP</b>
<b>TA</b>	1			
<b>Age</b>	0.55	1		
<b>CAR</b>	0.12	-0.04	1	
<b>GDP</b>	-0.12	-0.02	0.06	1

Per table 5, the correlation between the independent variables is generated to determine if they influence each other and affect the credibility of the regression results. Per the table, the independent variables generally have low correlations between each other. However, total assets and age have a correlation value of 0.55, showing a medium correlation between the two data variables. This can be explained by the fact that as banks continue operations, they tend to increase customer base, thus increasing deposits and size to accommodate their clientele. Total assets and CAR

also have a low correlation of 0.06 which could be because there is no proven theory relating the two variables.

Table 6

*VIF Results*

	<b>TA</b>	<b>Age</b>	<b>CAR</b>	<b>GDP</b>
<b>Efficiency Model</b>	1.16	1.10	1.03	1.03
<b>Profitability Model</b>	1.07	1.03	1.02	1.03

The VIF is the ratio of variance in a model with multiple terms, divided by the variance of a model with one term alone. It helps to assess the extent of the multicollinearity to determine whether some independent variables will skew the results of the regression. The rule of thumb states that if the VIF of an independent variable is 10 or greater, it should be removed from the model (Wooldridge, 2012). Per table 6, the variables in both models do not have VIF values greater than 10, thereby satisfying the condition.

#### *4.4.4 Hausman Test*

The Hausman test is conducted to determine whether to use a fixed or random effects model for the regression. There are two models being tested; efficiency and profitability models, thus, fixed and random tests will be used for each, and the Hausman test will be conducted to determine which type of model to be used for each performance model.

## 4.4.4.1 Efficiency Model Test

Table 7

*Fixed Effects Model for Efficiency Model*

	Estimate	Standard Error	Pr(> z )
TA	6.2254e-12	1.3697e-11	0.6509135
CAR	-0.91128	0.25092	0.0005412
GDP	0.16402	0.43729	0.7087682
Age	-0.0018593	0.0065363	0.7769243
Significant Codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1			
R-squared: 0.16973			
Adjusted R-squared: 0.0059842			
F-statistic: 3.47527 on 4 and 68 DF, p-value: 0.012137			

The two-tail p-values test the hypothesis that each coefficient is different from 0 (Torres-Reyna, 2007). Thus, the hypothesis is rejected if  $\Pr(> |t|)$  is lower than 0.05. Per table 7, all variables except CAR have p-values greater than 0.05. This means that all variables, except CAR, don't have a significant influence on predicting OER. Also, the p-value from the F-statistic is 0.0012137. This value is less than 0.05, showing that the fixed effect model, using the independent variables, significantly determines the OER of banks.

Table 8

*Random Effects Model for Efficiency Model*

	Estimate	Standard Error	Pr(> z )
(Intercept)	0.80791	0.100939	1.515e-13
TA	5.6636e-12	8.2687e-13	0.4933763
CAR	-0.89963	0.24523	0.0002439
GDP	0.15490	0.42975	0.7185198
Age	-0.001912	0.0018127	0.2915219
Significant Codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1			
R-squared: 0.17084			
Adjusted R-squared: 0.12541			
Chisq: 15.0408 on 4 DF, p-value: 0.0046174			

Per table 8, the p-values of CAR is less than 0.05, showing that it significantly influences OER. Also, the p-value of the model is 0.0046174. This value is less than 0.05 and this means that the independent variables of the model are significant in estimating the value of OER.

#### 4.4.4.2 Profitability Model Test

Table 9

##### *Fixed Effects Model for Profitability Model*

	Estimate	Standard Error	Pr(> z )
TA	-1.2949e-13	1.5552e-12	0.9339
CAR	0.11925	0.028489	0.00008348
GDP	-0.037914	0.049649	0.4477
Age	0.00025671	0.0007421	0.7305
Significant Codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1			
R-squared: 0.2321			
Adjusted R-squared: 0.13047			
F-statistic: 5.13833 on 4 and 68 DF, p-value: 0.0011202			

Per table 9, the p-values for all the variables except CAR are above 0.05, showing that they do not significantly influence the ROA. However, this might not be the case, as the p-value of 0.0011202 for the model, which is less than 0.05, also shows that the independent variables in the model significantly determine ROA.

Table 10

*Random Effects Model for Profitability Model*

	Estimate	Standard Error	Pr(> z )
(Intercept)	0.0049397	0.0071413	0.489121
TA	6.3831e-13	8.5997e-13	0.457937
CAR	0.1079600	0.028465	0.000149
GDP	-0.028236	0.050395	0.575278
Age	0.0001998	0.0000712	0.004988
Significant Codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1			
R-squared: 0.018091			
Adjusted R-squared: 0.01326			
Chisq: 26.5982 on 4 DF, p-value: 0.000023966			

Per table 10, Age and CAR have p-values less than 0.05, showing that they significantly influence the results of ROA in the model. The p-value for the model is also 0.0000239. This value is less than 0.05 and shows that the independent variables in the model significantly determine the ROA.

*4.4.4.3 Hausman Test Results*

The Hausman test was conducted for the profitability model to determine whether a random or fixed effects model should be used. The Hausman test states that if the p-value is less than 0.05, fixed effects model should be used (Torres-Reyna, 2007).

Table 11

*Hausman Test for Profitability Model*

F test for individual effects
Data: ROA ~ TA + CAR + GDP + Age
F = 6.0861, df1 = 8, df2 = 68, p-value = 6.772e-06
Alternative hypothesis: significant effects

Per table 11, the p-value from the test is approximately zero. This means that the results from the fixed effects model should be used for the analysis.

Table 12

*Hausman Test for Efficiency Model*

F test for individual effects
Data: OER ~ TA + CAR + GDP + Age
F = 12.077, df1 = 8, df2 = 68, p-value = 1.471e-10
Alternative hypothesis: significant effects

Per table 12, the p-value from the model is approximately zero and this is less than 0.05. Thus, the results from the fixed effects model should be used for the analysis.

#### 4.5 Interpretation of Regression Results

##### *4.5.1 Interpretation of Profitability Model Results*

Based on the Hausman test, the results from the fixed effects model will be analyzed for the profitability model. Per table 9, the coefficient of CAR is 0.11925. This shows a positive influence of CAR on the ROA of the selected universal banks. Thus, the ROA of the banks is expected to increase when there is an increase in the CAR regulation which currently stands at 10%. This result satisfies the null hypothesis, showing that unique factors in the Ghanaian economy as a result of it having an emerging market economy, gives the same results as other research done in developing countries and emerging market economies. In developed countries, ROA increases when capital requirement regulations such as CAR increased, but begins to fall after a threshold is exceeded. This positive correlation also has a p-value of 0.00008348. This value is approximately zero and is below the significant level of 0.05. This shows that it is significant in predicting the ROA of the universal banks.

All other variables in the model do not significantly influence of the ROA because of their high p-values. Per table 9, age has a correlation coefficient of 0.000257 and a p-value of 0.7305, showing an insignificant influence on the ROA of the universal banks. Total assets and real GDP growth also showed lower correlation or influence on ROA and were not significant influencers of the dependent variable. Total assets recorded a coefficient that is approximately zero while real GDP growth recorded a value of -0.0379. The R-squared value of the model is 0.2321. This means that the independent variables of the model explain 23.21% of the results seen in the ROA of the universal banks. Thus, 23.21% of the variations in ROA of universal banks can be explained by the independent variables in the model. The model also has a p-value of 0.011202. This value is less than the significant level of 0.05, showing that the independent variables are statistically significant in estimating the ROA

#### *4.5.2 Interpretation of Efficiency Model Results*

The results from the fixed effects model for efficiency will also be analyzed because of the results of the Hausman test. According to table 7, CAR has a coefficient of -0.91128 and a p-value of 0.0005412. This means that CAR has a negative influence on the OER of the banks. With every one-unit increase in CAR, the OER of the universal banks will decrease by at least 0.9 and vice versa. This result also satisfies the null hypothesis. It shows that universal banks in Ghana tend to be more efficient with the increase in CAR and other capital requirements. This could also be as a result of unique conditions in the Ghanaian economy. This result tallies with the results observed in other developing countries and emerging market economies such as Tunisia. CAR affects OER and its p-value of 0.0005412 shows that it has a significant influence on the estimation or prediction of OER. When CAR



increases, OER is expected to fall, showing that the banks are more efficient. Total assets also has a coefficient that is positive and approximately zero. Real GDP growth has a positive coefficient of 0.16402 and age has a negative coefficient of -0.0018593. The three control variables have p-values greater than the significance level of 0.05, showing an insignificant predication of the OER. The R-squared value of the model is 0.16973. This means that the model, with reference to the independent variables, explains 16.97% of the variations in OER. The p-value of the model is also below the 0.05 significant level at 0.012137, showing that the independent variables are significant estimators of the value of OER of universal banks in Ghana.

## CHAPTER 5- CONCLUSION & RECOMMENDATIONS

### 5.1 Introduction

This chapter concludes the research by identifying the rationale behind undertaking the research and a summary of the findings and implications of the research results. In addition, it looks at recommendations that are made to the BOG based on the results of the research and the need to conduct more research that caters for the limitations that were faced in this research.

### 5.2 Summary of Rational of Research

The rationale behind the research was the need to understand how universal banks in Ghana are affected by banking regulations. This information is important because of the relevance of universal banks in the Ghanaian economy. Thus, understanding the effects would give the BOG and SEC the needed information to regulate the industry in a more efficient manner.

Another rationale was the need to forecast the impact of future regulation changes on the performance of universal banks. After the Ghanaian banking crisis in 2018, the BOG introduced new regulations to improve the sanctity of commercial and universal banks. Some of these regulations included an increase in minimum commercial capital requirement to GHS400 million in 2017 (Banda, 2018). Banks were given a period of one year to meet the new capital requirement to prevent being shut down or taken over by the government. In addition, 5 banks were consolidated into one institution while others had their licenses downgraded (Mohammed, 2019). These new regulations will affect the performance of the banks in the near future and long term. Thus, the results of the research serve as a foundation in deducing the impact of the regulations on the future of universal banks.

### 5.3 Summary of Main Findings and Implications

The findings from the research show that CAR affects the performance metrics of universal banks. Increase in the requirement leads to a reduction in the OER of universal banks and leads to an increase in the ROA of the banks. This shows that CAR has a negative relationship with OER and a positive relationship with ROA. The findings also show that additional variables including bank age, bank size (total assets) and real GDP growth also have a relationship with the OER and ROA of the universal banks. Total Assets and real GDP growth are negatively correlated with ROA and positively related with OER. Also, age is positively correlated with ROA, but negatively correlated with OER.

The OER of banks fell with an increase in CAR. A decrease in OER in universal banks means that the banks recorded lower operating expenses as compared to gross operating income. Thus, the percentage of gross operating income catering for operating expenses decreased. This could mean that the banks become more efficient with managing their operating expenses when the CAR is increased. This could also be as a result of better revenue generation strategies to increase revenue.

The ROA of banks had a positive relationship with CAR. As CAR increased, ROA increased. The ROA shows how profitable the universal banks are by showing the return they generate on their assets. The positive relationship shows that, based on ROA, banks are more profitable when CAR is increased. This might be different for other profitability metrics such as ROE and gross profit margin.

The findings show that currently, universal banks in Ghana tend to benefit from the increase in CAR. The banks should be more efficient and profitable when the requirement is increased. However, this does not mean that infinite increase in the requirement will be beneficial to banks. Ozili (2017) found that even though increase

in a regulation like minimum capital requirement is beneficial for banks in the developing countries he studies, there is a threshold, above which, increase in minimum capital requirement can hurt the performance of banks. Thus, there should be a limit to how much the BOG can increase the minimum capital requirement. Since the regulation being studied is CAR, an increase in the regulation could potentially benefit banks. They should expect increase in profitability and efficiency as a result of an increase in CAR. However, continuous increase in the regulation can soon offset the benefits to banks if CAR is increased passed a certain beneficial threshold.

#### 5.4 Recommendations

After the 2018 Ghanaian banking crisis, the government reformed the banking sector to secure it for customers. This involved increasing regulations on capital requirement, consolidating some banks and revoking the licenses of others. Banks were supervised more closely in the aftermath to ensure they were following the new regulations. However, the sector still has a long way to go before it is strong enough to be less monitored. Also, the customers need more assurance about the sanctity of the banking sector to have more faith in the system.

Per the research results, it is recommended that to safeguard the funds of citizens in universal banks, but also secure the good performance of the banks, the BOG should undertake gradual but small increases in CAR and the minimum capital requirements. This is beneficial because it gives the citizens the assurance that the banks have more capital available to operate and the banks are less likely to be illiquid. In addition, it also benefits the universal banks, based on the research results. The universal banks will be able to increase their profitability and efficiency through the increase the regulations, also making them more sustainable and sounder for

business. However, it is important to note that the gradual increase should be tracked carefully and subsequent data analysis on the effect on the performance metrics should be conducted to ensure that the increase in the requirement is benefiting both banks and citizens. Through this, a threshold will be actualized for banks, and the BOG will be able to change the regulation effectively during economic booms and recessions. It is likely that the BOG will introduce more regulations to safeguard the sector so as to prevent another banking crisis.

### 5.5 Recommendations for Further Research

Further research should be done, including other important regulations such as liquidity ratio and solvency ratio. These regulations could also have a significant on the performance metrics. Thus, in the event that they are changed in the future, research should include them to understand their impact on the performance of universal banks.

Another recommendation for further research is that non-listed universal banks should be included in the research. Listed banks were used in this research because of the availability of information from their financial statements. However, the fact that the banks are listed on the GSE could also be a factor influencing the results of the research. Further research should be done on non-listed universal banks to understand whether banks that are listed and not listed, experience the same impact from changes in regulation.

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