

**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI**

**(KNUST SCHOOL OF BUSINESS)**

**KNUST**

**THE ALTMAN EMERGING MARKET Z-SCORE MODEL: VERIFYING ITS VALIDITY  
AS A PREDICTOR OF CORPORATE FAILURE IN THE CASE OF BANKS IN GHANA**

**BY**

**ANGSOYIRI DRAMANI**

**INDEX NUMBER: GP4397718**

**STUDENT NO: 20604046**

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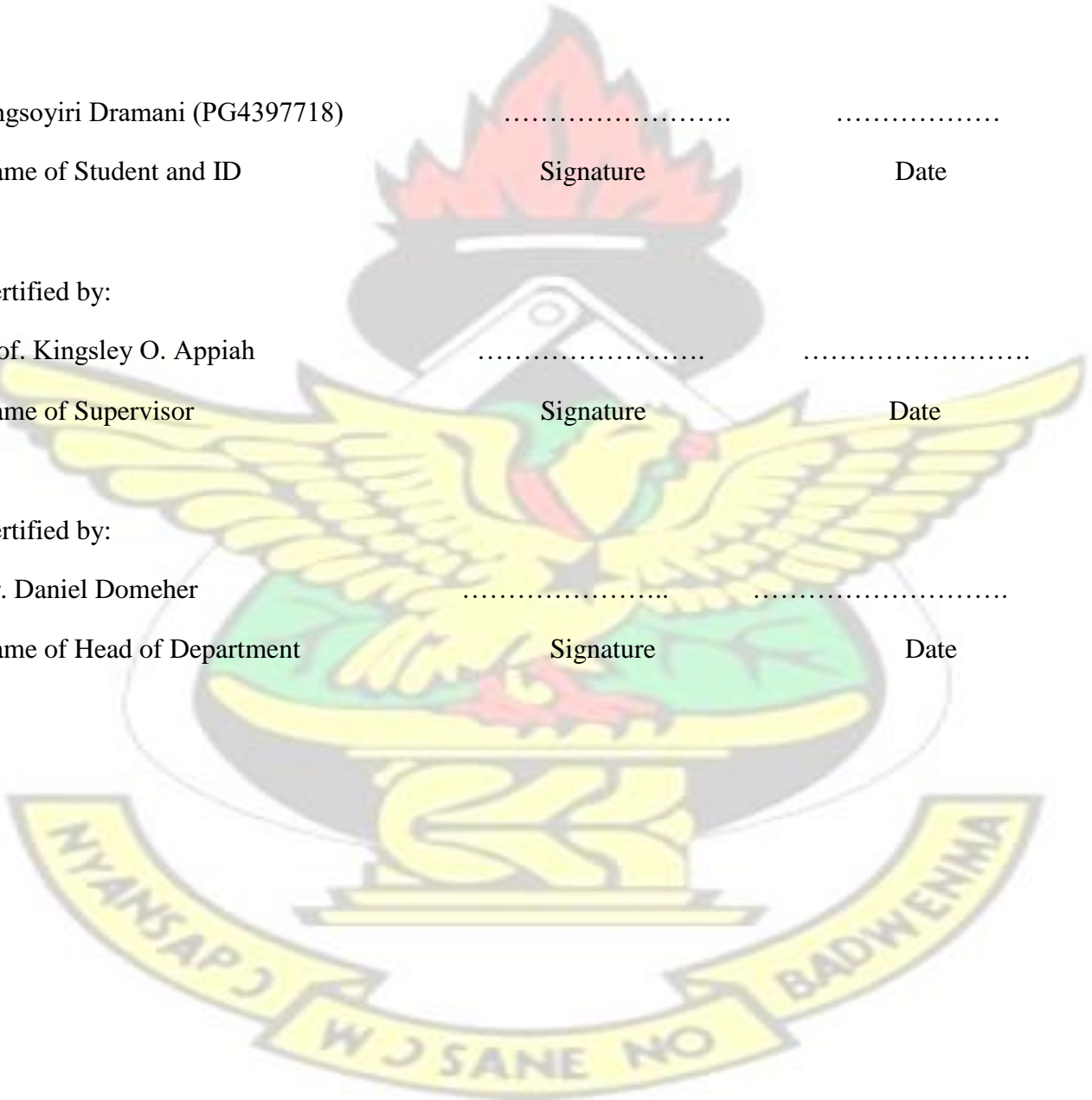
**DECLARATION**

I hereby declare that this submission is my own work towards the Master of Business Administration (Accounting option) Degree and that, to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the reward of any other degree of the University, except where due acknowledgment has been made in the report.

Angsoyiri Dramani (PG4397718) .....  
Name of Student and ID Signature Date

Certified by:  
Prof. Kingsley O. Appiah .....  
Name of Supervisor Signature Date

Certified by:  
Dr. Daniel Domeher .....  
Name of Head of Department Signature Date



## ABSTRACT

Banks in Ghana contribute considerably to the country's economy by creating employment opportunities. However, in spite of the significant contributions that the Banking sector plays in the Ghanaian economy, corporate failure of the sector is high. Research has scarcely been done in predicting corporate failure of Banks using the emerging market Z-score. This research sought to bridge this gap by applying the emerging market Z-score model by Altman: confirming its legitimacy as a predictor of business failure in the case of Banks in Ghana. The primary goals of the research are how to put into operation the emerging market Z-score model in predicting corporate failure and to evaluate financial performance through the analysis of the annual audited report of 12 banks in Ghana. This study was anchored on various theories including resource dependence, liquidity preference, pecking order, and entropy theory. The descriptive research design was used in this research. The target population was Banks in Ghana. The study adopted a purposive sampling method to collect secondary data from the 12 banks. Data was analyzed using Microsoft word excel and presented in the form of figures and tables. The outcome of the research discovered that the following ratios are significant discriminators and predictors of corporate failure of quoted banks in Ghana: book value of equity to total liabilities, retained earnings to total assets, profit before interest and tax to total assets, working capital to total assets. Consequently, the emerging market z-score ratio model was found to be a robust model in predicting corporate failure of listed banks in Ghana. The study recommends the adoption of the EM Z-score model as a utility predictor of corporate failure in Ghana. This study has implications for the policy since it establishes a versatile model of preventing the corporate failure of Banks whose sustainability is pertinent in achieving the countries sustainable development agenda and economic growth. The study also contributes to the existing body of knowledge of extending the discourse of the application of the EM Z-score ratio model in predicting corporate failure by applying discriminate analysis. It was established in this study that the prognostic capability of the emerging market Z-score model was precise in predicting corporate failure of quoted banks in Ghana; hence the powers that be can use this model to take precautionary actions.

## DEDICATION

I dedicate this project work to Almighty God for His mercies and grace upon my life throughout my stay in Kwame Nkrumah University of Science and Technology Kumasi and to my Supervisor for his immense contribution and support throughout this study.





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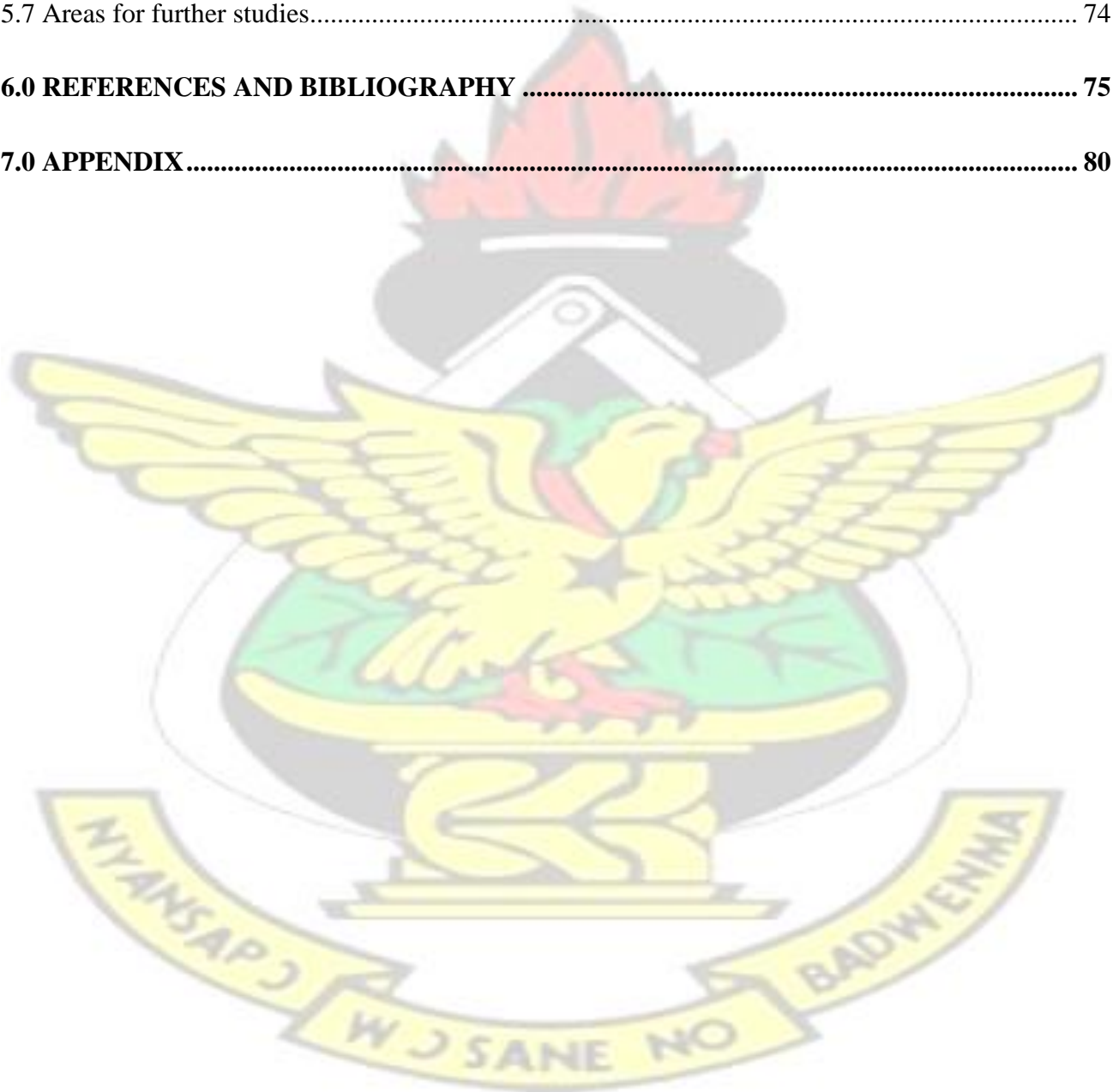
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## CHAPTER ONE

### INTRODUCTION

#### 1.0 Background of the Study

A vigorous financial sector applies guidelines and micro-policy instruments to ensure corporate accountability and more credible investment environment for safeguarding invested resources (Agyemang et al, 2013). A financial system which is replete with dysfunctional corporate behaviours where participants knowingly violates established control system regulations and rules procedures of operation cannot be a healthy one. In 2017, the bank of Ghana identified that the industry was plagued with weak quality assets, insider trading abuses, poor corporate governance and weak capital base. Thus emergent bankruptcy problems were staring. The bank of Ghana order banks in Ghana to raise their capital base from the initial GHS120 million to GHS400 million. The bank of Ghana clean up the banking system in order to sanitise same. This led to the withdrawal of the operation licences of non- performing financial establishment and a receiver appointed to take over the assets and liabilities of the affected establishment to be sold to pay depositors.

Preliminary evaluation of the literature on corporate failure shows that there is no distinct definition of corporate failure. Pratten (1992) explains corporate failure which falls short of a definition. Pratten describes business failure as the lack of ability of a business organization to meet its mission. This designation or explanation is not broad in scope as several businesses are still in operation but unable to attain or meet their mission. This rather is an early warning signal of corporate failure. Aliakbari, (2009) explains corporate failure as the likelihood that a person, business, or association will possibly no longer be able to repay its outstanding debt. Corporate failure has to turn out to be a solemn area in the field of finance for the purpose that it harms the company's performance,



therefore, decreasing the company's ability to exist (Khaliq, Basheer, Mohd, Thaker & Nurun, 2014). Company failure is said to be excessive when a business organization's current liability is more than the fair value of its fixed and current assets (Mohammed and Soon, 2012). Bhurnia and Sarkar (2011) suggest that corporate failure is excessive when a corporation exhibits a circumstance in which a business is no more feasible as a going concern in such a case; the organization is no longer in a position to meet its financial obligation. Corporate failure is a phrase used in company finance to point out a circumstance when a business entity is incapable of meeting the creditor's obligation or meet this monetary task with some difficulties, which eventually leads to liquidation.

Korteweg (2007), describes corporate failure in a greater broader sense, the company is in decline the economic effects which result in a shortage of cash. It is situations in which an organization's financial responsibilities are no longer met or are met with some level of difficulties. This usually arises when a firm is disadvantaged by means of taking more debts thereby increasing the danger of company failure which is unfavorable to shareholders and debt holders. The severe kind of company failure is liquidation, which is unpleasant because it consists of legal costs and might also compel a corporation to put up for sale its assets at a distress price (Gibson, 2011). Therefore, corporate failure prediction is essential so that remedial actions can be taken early to salvage these business organizations which can be salvaged, and shut down those that cannot be salvaged. Alareeni and Branson (2013) assert that the majority of corporate failure forecast methods such as the Altman Z-score model were developed and tested in advanced nations such as Europe and the U.S.A and they have not often been utilized in growing countries like Ghana and Africa as a whole.

The Z-score ratio by Altman is the most frequent statistical model used. This research targeted the utilization of the emerging market Z- rating ratios in the prediction of the company's failure of banks in Ghana. The outcome of this study is probable to make available information that will allow

stakeholders to take early corrective action, which will consist of salvaging these corporations that can be saved from liquidation and shut down those that cannot be saved or salvage (Brigham & Daves, 2010). It is well worth noting that in spite of the magnificent role of these companies to the financial system such as the provision of employment opportunities, manufacturing of goods, and the provision of services for home and industrial consumption, the generation of government revenue through taxes and boosting exports, the financial performance of the area is wanting.

The Z-score model by Altman is a multivariate method that makes use of mixtures of ratios to predict the likelihood that a corporation is bankrupt (Altman, 1968). Various researchers have additionally mounted the defense that the Z-rating model is the most terrific method used to predict corporate failure (Bhurnia & Sarkar, 2011; Bhatt, 2012; Alkhatib & Bzour, 2011; Sitati & Odipo, 2009). Therefore, this research will assist decision-makers and other stakeholders to evaluate listed companies concerning deposit analysis, investment analysis, and their going concern ability. This is because the prior diagnosis of financial failure in the Ghana industry especially in the Banking industry is vital due to the growing number of financial challenges faced by banks quoted on the Ghana Stock market and the banking sector as a whole especially the recent banking crisis.

### **1.1 Problem Statement of the study**

The existing literature in predicting corporate failure done in peripheral areas revealed contextual, conceptual, and methodological gaps. Contextually, research has been carried out in developed nations for example: Bimpong, P., Arhin, I., Danso, E., Benedict, A. and Tettey, G. (2020), Musah, A. and Agwirakwah, J. A., (2019), (Li & June 2012; Bhatt, 2012; Alkhatib & Bzour, 2011) which outcome cannot be applied in Ghana listed Banks because of variations in nature of the business, social and economic stipulations of exclusive countries (Appiah, 2011). Other studies conducted in

Ghana were in different sectors, for example, the small and medium enterprise sector (Prince Gyimah, Kingsley O. Robert N. Lussier 2019), Corporate organizations (Boakye A. and Evans A. 2014), (Samnhyia, Oware and; Anison-Yaansah, 2016), whose findings cannot be applied in listed Banks because of differences in the regulatory systems. The conceptual gap, on the other hand, exists due to the fact that previous studies done by other researchers present conceptual gaps arising from the use of non-financial elements to predict company failure (Kingsley Opoku Appiah, Amon Chizema and Joseph Arthur, 2015). Therefore, this research utilizes the emerging market Altman Z-score ratios model to predict the company failure of Banks in Ghana, this is due to the fact that despite the top-notch role of Banks in Ghana such as the provision of employment opportunities, and the provision of services for home and industrial consumption, the generation of income for the government through taxes, the financial performance of the banking sector is not good enough. The potential likelihood of insolvency of quoted banks in Ghana has brought about the privatization of the government-owned Banks in order to salvage the banking sector in Ghana.

The prediction of company failure is likely to assist several stakeholders which include the government of Ghana in evaluating how to improve GDP towards the country's debt when you consider that the debt has increased from 57.2% in 2018 to 63% in 2020 (a figure projected by IMF) in opposition to the GDP for the reason that reimbursement of the country's debt is expected to rely on the overall performance of its country's economic system (Simic, Kovac & Simic, 2012; Rijken, 2011). Other policymakers the study is likely to supply them with facts on company failure and ways through which to mitigate the negative effect and the degree of company failure. Therefore there is the need to investigate the monetary and financial soundness of banks in Ghana because of the pertinent role they play in the direction of sustainable monetary development. The above-reviewed research shows that the model has been significantly applied in predicting company failure

in the Ghana economic system however little attention to banks in Ghana, for this reason, the need for this research which covered a comprehensive view of all quoted Banks in Ghana. It is in opposition to this backdrop that the current research is based.

## **1.2 Research Objectives of the study**

The associated Objectives of this research are as follows:

1. To examine the efficacy of the emerging market Z-score by Altman in benching marking the performance of banks in Ghana financially.
2. To investigate the level of accuracy and reliability of the emerging market Z-score on banks in Ghana.

## **1.3 Research questions of the study**

In the researcher's bid to accomplish the research objectives, the researcher seeks to discover answers to the following research questions:

1. What is the efficacy of Altman's emerging market Z-score ratio in benching marking the financial performance of banks in Ghana?
2. What is the degree of accuracy and dependability of the emerging market Z-score ratio applied to banks in Ghana?



#### **1.4 Significance of the Study**

The result of this research seeks to make contributions to literature and knowledge in the subject matter under examination. It serves as a source of reference to academics, students researchers. Policymakers, and other stakeholders involved in the Banks sector in Ghana.

The accomplishment of the country's progress will depend on the sustainability of Banks and the manufacturing sub-sector which is significant in attaining the country's sustainable development and fiscal growth. Quoted Banks on the Ghana Stock Market comprise Ecobank Ghana Limited, Access Bank Ghana, Republic Bank Ghana limited, Agricultural Development Bank, Cal Bank limited, and Ghana Commercial Bank limited which form part of the Banking sector in Ghana and this calls for the need to forecast the corporate failure of the banking industry so that policymakers and various stakeholders and people who have interest in the operations of the business can take the necessary actions to salvage these Banks if the need be.



#### **1.5 Overview of methodology**

This phase of the research offers a brief explanation of steps taken to arrive at the Altman emerging market Z-score ratio model. The approach used in this research is in line with previous research, mostly Parshar (2000) and Altman (2002) that uphold the Z-score model with 80 percent prediction accuracy. These previous researchers confirm that it is a robust instrument that helps in predicting and assessing the overall performance of companies financially and possible distress of corporate organizations given that it consists of numerous ratios financially that can be utilized to forecast business liquidation, corporate failure, and financial distress. The method set up in this research is to study the annual report of banks in Ghana by computing their Altman emerging market Z-score ratio for four(4) years that is from 2015 to 2018 and comparing it with 2019 which is the recent year

emerging market Z-score ratio in order to evaluate the on the whole performance of the banks financially as well as the possibility of liquidation of banks in Ghana.

$$\text{Emerging Market Z-score} = 3.25 + 6.56(X1) + 3.26(X2) + 6.75(X3) + 1.05(X4)$$

Definitions of variables

X1= the ratio of working capital to total assets: Determine the net liquid assets of the enterprise in relation to total assets and establish the commercial enterprise capability to manage the liquidity of the business. The liquid asset of the business or working capital is measured by means of deducting total liabilities from the total asset current asset as a canon a distressed commercial enterprise will experience a decrease in working capital.

X2= the ratio of retained earnings to total assets: Determine the retained profits in relation to total assets and establishes the collective profitability.

X3= the ratio of earnings before taxation and interest: is determined by dividing profit before interest and taxation (PBIT) by total asset. It establishes the business's potential to produce earnings from the whole of its total assets. This ratio is extraordinarily essential when determining company survival and establishing the effectiveness of the business general and stress the level of productiveness resulting from money borrowed in particular.

X4= the ratio of equity to total liabilities; this ratio determines the market value of equity to total liabilities, the high the score, the less probable for liquidation or insolvency.

Where cut off rankings reflect

Safe if higher than 2.60

Bankrupt if much less than 1.10

Grey region 1.10-2.60

### **1.6 Scope and delimitation of the study**

This study sought to use the Altman emerging market Z-rating ratios to predict the corporate failure of banks in Ghana. This research has some limitations, comparable to other empirical research on the same topic at hand. Exclusively, the Altman emerging market Z-score ratio obtained in the tests performed in Ghana on listed companies (banks, insurance, and financial companies were excluded) could not be generalized to other countries, even to countries with common environmental factors. Therefore, for companies quoted on different markets, it might be advisable to proceed to a preliminary validation of the model (Appiah 2011)

Secondary data from the annual report of the quoted banks were historic because the variables utilized in the computation of the emerging market Altman's Z- ratio are primarily based on traditional monetary information (Palenu & Healy, 2008). Nevertheless, this issue was once mitigated with the aid of the use of the emerging market Altman's Z- score ratios model which is a combination of ratios measuring a number of components of financial overall performance ranging from liquidity, profitability, gearing, efficiency, and market value ratios (Slotemaker, 2008). Additionally, the study applied trend analysis which included four years for Banks in Ghana. Trend examination was crucial for the reason that it helped the researcher to establish the movement in financial ratios and changes in those movements over some time as opined by Kirkham (2012).

## **1.7 The Organization of the study**

Chapter one is made up of the background of the study, the problem statement of the study, objectives of the research, and research questions of the study, the significance of the study, and delimitation and scope of the study. Chapters two consist of the theoretical review, the conceptual review, the empirical review, and lastly conceptual framework. Chapter three contains the researcher design, population, and sampling, the technique of data collection, statistics evaluation technique, sampling strategy. Chapter four is based on data presentation and analysis of findings. Chapter five summarized the conclusion, findings, area for further research, and recommendations for the study.





## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Introduction

This chapter covers the theoretical assessment of the theories that the research was anchored on, theoretical review, and overview of concepts, prediction model, and empirical assessment of previous research related to the study, conceptual framework, and summary of literature review. The purpose of this chapter was once to sharpen the researcher's appreciation in predicting corporate failure of Banks in Ghana by employing the emerging market Z- score ratios model.

#### 2.2 Theoretical Review

Grant and Osanloo (2014) explain a theoretical framework as a blueprint or a guide for a study. Besides, Dollinger (1999) points out that a good theory tells the users how things and events are related, which are likely to be external forces, uncontrollable, and internal forces controllable. According to Sinclair (2007), it is the foundation upon which the research is constructed. Additionally, the theoretical framework consists of the principles constructs, and concepts of a theory (Grant & Osanloo, 2014). This study was anchored on several theories as discussed below because they make research findings more meaningful and generalizable (Akintoye, 2015)

#### 2.1 Resource Dependence Theory

A company relies upon on it external surroundings for resources, which are key for its survival such as raw materials and money, an organization which depends on the external environment for its key resources needs such as funding will be subjected to control by external parties (Brettel and Voss, 2013). In this study, increased borrowing is likely to reduce the emerging market Z-score ratio value

and therefore increase company failure because of high-interest rate payment which will reduce net worth, cash flow, and profitability. Henry (2011) explains that if an entity is unable to get the proper aggregate of human and natural resources, it will finally fail. Human and natural resources will be viewed as essential as soon as they make it feasible for an employer to enforce strategies and formulate policies that will enhance effectiveness and efficiency. Hessels and Terjesen, (2010), asserts that business is supposed to acquire resources from its external environment, on the other hand, commercial enterprise is required to use these assets in a manner which will minimize or will add to their depends on the external environment by means of using such actions as an alliance and joint venture. In this research efficiency and effective use of assets which are external to the business to produce extra income that is in all likelihood going to have an effect of increasing retained revenue and profitability that add to the book value of equity and for this reason expand in the emerging market Z-score ratio, therefore reducing company failure likelihood. Kraaijen-brink, Spender, and Groen,(2010) suggest that the resource-based theory is geared towards explaining the internal sources of company sustained competitive advantage and the more competitive advantage which implies that the more competitive the company is the lower the rate of corporate failure.

In this study conflict between management and listed Banks and stakeholders is probable to decrease profitability, cash flows, and increasing agency issues which ultimately are probable to lead to multiplied company failure. The lack of ability to convey together such things implies that the likelihood of the business achieving its most wanted outcomes (such as endured existence) is reduced and therefore growing corporate failure. Nemati et al., (2010), provide an explanation that the best strategies will be a combination of both resources by evaluating the opportunities and threats and making decisions based on the situation. These resource-based theories acknowledge the influence that external forces have on the organization. Hillman, Withers, and; Collins, 2009),

explain resource dependence as a theory that appreciates the effect external factors have on the organization. Executives and management may act to alleviate environmental dependence and uncertainties via using the resources effectively. In this study, management must utilize well the total resources (resources) which have been employed in the commercial enterprise to increase revenue, profitability, and cash flows that eventually extend the EM Z-score consequently decreasing the corporate failure. Klein, McGahan, Mahoney, and Pitelis, (2011), suggest that organizations often acquire resources sometimes under very hard conditions due to competition among them, this is based on attaining competitive advantage in terms of efficiency and effectiveness in the utilization of resources required that result in the acquisition of additional resources. Effective use of the resources had the influence of the value of the emerging market Z-score in this study and subsequently lowering corporate failure due to improved sales, profitability, cash flows, and net worth. Those organizations which fall short to constantly appraise the quality and quantity and the helpfulness of the organization resources cannot carry out effectively their undertaking and organization mission in order to create worth or act in response to change in their immediate environment (Fraczkiewicz-Wronka, 2013). This theory supports the following independent variables; profit before interest and tax to total assets, working capital to total assets, and the book value of equity to total liabilities ratio because the more the resource the company has, the more the total assets and retained earnings the company is likely to have which in turn will be added to book value of equity and hence increasing the internal borrowing power thus reducing the financial risk of the company by increasing the EM Z-score value. Business organizations utilize the resource-based principle because companies utilize resources it's already possessed in order to obtain other resources and the cost of obtaining new resources or the monetary value it obtains with the resources will depend on the resources that are already in the business, Warner (2011). In this study, the extra resources in terms of the total assets

of banks in Ghana have, and if well utilized will generate extra sales, profitability, cash flows, and lower company failure.

## **2.2 Liquidity Preference Theory**

The liquidity preference concept argues that the demand for cash is not to borrow money, however, the corporation should aim to remain liquid this is because if the organization borrows more it will reduce profitability, cash flows, and net well worth due to high-interest charge (Stewart, 2011), which in this case is probable to increase corporate failure. The principle was developed by Keynes (1935), who believed that individuals and business organizations keep the money for three fundamental motives: Transactional purpose which states that money is being held to be in a position to settle the day to day operating expense of the business or entity. The amount of liquidity required will depend on the stage of activities of the person or entity; the greater the level of activities, the more money will be required. This study utilized the independent variable working capital to total asset ratio to measure the liquidity of banks in Ghana, those Banks which had negative, decreasing, or decrease working capital to total asset ratio were termed by the research as illiquid Banks. This was in line with Petersen and Plenborg (2012), they argued that a business is likely not able to meet it is short term period responsibilities as they fall due when it is no longer liquid and that liquidity is affected by way of the firm's potential to generate enough cash inflows both in the short term and long term. The precautionary motive refers to the demand for liquid money to allow the business enterprise to meet its unexpected expenses. Listed Banks which had their ratio of profit before taxation and interest to total asset, ratio of retained earnings to total asset, and the ratio of the book value of equity or market value of equity to total liabilities increasing were seen by the research as having fulfilled the precautionary intent of holding cash and they were categorized by the study as business organizations with low corporate failure likelihood. The speculative motive refers to the



ability of the business organization to keep adequate cash to take advantage of future changes in the market interest rates or security price changes. According to Keynes (1935) the more the interest charges the decrease in the speculative demand for cash which decreases the activity rate, the higher the speculative demand for money. It confirms the finding of Bhurnia and Sarkar (2011), who states that corporate failure is high when the firm is experiencing monetary troubles such that its money inflows are inadequate to meet its debt obligations

In this study, those Banks which had superb and the ratio of working capital to the total asset (liquid), were in a position to speculate and repay their loans which decreased their total liabilities, meaning that the book value of equity or market value of equity to total liabilities ratio increased, hence the upward increase of EM Z-score and reduced corporate failure, they were also the likelihood to borrow when the interest rate charged is low, which additionally reduced their total liabilities and increase the retained earnings, which is normally added to the market value of equity or the book value of equity, meaning increasing the rate of the EM Z-score which decreased their corporate failure (Stewart, 2011). This theory, therefore, helps the following independent variables; the ratio of the book value of equity to total liabilities and the ratio of working capital to total assets. This is due to the fact that the more liquid the Bank is the higher the ratio of working capital to total assets which for this study has the impact of increasing the emerging market Z-score, therefore, decreasing company failure. The extra liquid the Bank is the much less the borrowings which for this study had a probable influence of reducing total liabilities which in term increase the value of the emerging market Z-score and minimize corporate failure.

### 2.3 The Pecking Order Theory

This theory as advanced by Myer in the year 1984, suggests that a company has a favorite chain of command for its financial decision-making. Companies will prefer to borrow rather than issue equity if its in-house finances are not enough to finance its investment in the form of capital expenditure since borrowing increases the total liabilities and interest payment obligations which reduces profitability eventually increases corporate failure due to a reduction in the ratio of the book value of equity or market value of equity to the firms total liability which has a final consequence of reducing the Altman emerging market Z-score ratio. The utmost first choice is to utilize in-house sources of financing of borrowing before resorting to external sources. Shirkh and Wang (2010), suggest that capital structure is mostly concerns with the optimal operational cost of the business organization. The comparative proportion of capital structure of equity and debt is utilized to finance the company activities ( Mutairi 2011). Besides, Mostafa and Boregowda (2014) state that there are two most important sources of a firm's finance mainly in-house financing that is composed of majorly retained earnings and external financing which is made up of debt or issue of equity.

The concept, advance for a negative association connecting debt and profitability ratio. According to the tradeoff concept and the pecking order theory, firms with, excessive total assets regarding debt ratio are associated with lower costs of bankruptcy, due to the fact that tangible assets are less probably to be subjected to a huge loss of value in case of business failure (Drobertz et al., 2013). Besides, it will be an indication that most of the Bank's total assets are financed with the aid of internal funds as a substitute to an external fund leading to corporate failure being low. Myers, (1984), suggests that resources generated internally have no cost of flotation and therefore do not require any additional dissemination of monetary information which might cause a probable loss of competitive edge over competitors in the future. The quantity of the debt that an organization owns

is likely to determine the company's cumulative needs to obtain financial resources externally. The pecking order theory serves as a motivation for financial managers to maintain control of the business organization and also to reduce the cost of equity by agent and by so doing avoid market reaction to the negative announcement of issues of new equity.

An organization's capital type is the product of its financing necessities over some time and its choices to reduce adverse determination expenses (Drobetz et al., 2013). The principle of the pecking order theory prioritizes the financial source in order of the extent to which they affect information symmetry. Firms have a preference for retained income as their major supply of finances, then liability, and the least preferred one is external sources which is equity financing. Alzomaia, (2014) suggests that business organizations will issue new equity only if they presumed greater worthwhile investment opportunities which cannot be postponed if not will be lost forever or financed by means of a debtor if top executives accept it as true with that shares are puffed up. The pecking order principle has two main assumptions about managers who are in charge of the business organization's finances; the first is that there are future growth opportunities available than external investment and secondly the company financial managers are aware of the more proposed profits.

This principle helps the following independent variables; retained revenue to firms total assets, the market value of equity or market value of equity to total liability, and retained income to total assets due to the fact the company with excessive ranges of internal financing is possible to be free from company failure. This is because inside financing is probably to minimize interest repayments which will expand the market value of equity hence lowering the corporate failure through increasing the value of EM Z-score. La Rocca, Cariola, and; La Rocca, (2011) also utilized the pecking order theory idea and establish that business organizations utilize an internal source of finance than external sources of finance because internal funding is received at the lowest costs. The study found

that this theory applies to this research due to the fact any enterprise which financed its total assets basically by using external borrowing is likely to result in paying more interest (servicing the debts) this, in turn, reduces profitability, cash flows, and net worth which reduces the value of EM Z-score thus, increasing the corporate failure due to reduction in the value of the EM Z-score.

#### **2.2.4 The Theory of Entropy**

This theory is additionally referred to as the financial statement position measure breakdown appraise theory (Aziz & Dar, 2006). The principle is based totally on the fact that it is sensible to perceive the conceivable risks of corporate failure of a firm with the aid of carefully inspecting the wide variety of adjustments in the statement of position and the income statement (Aziz & Dar, 2006). It utilizes both multiplied discriminate analysis (MDA) where many ratios are analyzed at the same time and the Univariate analysis (UA) where one ratio is analyzed in analyzing the changes in the configuration of the statement of financial position (Slotemaker, 2008). Besides, univariate analysis is the use of a single accounting-based ratio as an indicator of predicting corporate failure (Natalia, 2007).

The accounting ratios that were computed for the research are

X1 = Working Capital to Total Assets

X2 = Retained Earnings to Total Assets

X3 = EBIT to Total Assets

X4 = Book Value of Equity or Market Value of Equity to Total Liabilities

X5 = Sales to Total Assets Ratio



When the above ratios are combined to get one value like in the case of the Z- score value it is referred to as multiple analysis (Slotemaker, 2008).

Various studies have used the Entropy principle (Monti & Moriano, 2010; Aziz & Sayari, 2013; Sun; Li, 2008) on their empirical assessment for related studies. Data have been acquired from the organization's statements of income and financial position with the aid of a data gathering sheet. This theory supports all the Altman's Z score ratios (independent variables) because the modifications in all these ratios over the years of the study impacted both positively or negatively on the assessment of the corporate failure of banks in Ghana. This is because an increase in incomes is likely to enhance the value of the EM Z-score and reduce corporate failure due to increase cash flows, net worth, and profitability, while on the other hand, an increase in expenses is likely to reduce profitability, cash flows and net worth hence reducing the value of EM Z-score which in turn increases the corporate failure of the company.

## **2.3 Review of Concepts of Corporate Failure**

### **2.3.1 Corporate Failure**

Corporate failure is the condition that makes a business organization shut down its operations due to its inability to generate enough profit to continue its day-to-day business transactions successfully. There are two main kinds of company failure. Firstly, company failure is a condition in which the business organization faces monetary insolvency. Secondly, economic failure or collapse is defined as a company fails to attain the return on capital invested, Argenti (1986). Meeks and Meeks (2009) assert that in these cases the business organization might wind-up and might show the way to corporate failure.



The concept of corporate failure may be explained in various forms such as bankruptcy, government interference by means of the special finance package, liquidation, the Delisting of a company, insolvency, default in bank loans, default in bonds, or stock (Atlman and Narayanan, 2007). Under a wider explanation, corporate failure is the situation where a business organization cannot meet its financial obligations when they fall due to bankers, lenders, preference shareholders, or bankruptcy according to the operation of the law (Wu, 2010). A classical example is Heritage bank Ghana limited in Ghana. The concept of corporate failure is also known as financial distress which is used excessively in most financial studies available. Financial distress is the circumstance where a business's total liability is more than its book value of equity or market value of equity, which is predominant, might lead to financial distress. Johnsen and Melicher (1994), suggest that financial distress occurs when a company fixed expenditure to increase over some time. The term insolvency and bankruptcy are the two main terms that are utilized predominately in most literature. The term bankruptcy occurs when business establishments are incapable of paying their debt obligation to bankers, lenders, suppliers, employees, and tax authorities. Mckee (2003), suggests that bankruptcy occurs when the total liabilities of the company are more than the fair value of the business organization's total assets which may lead to bankruptcy and where the assets are used to settle part of the amount owing. Ahn (2001), in sharp contrast, suggests that insolvency on the other hand occurs when a firm is no more capable of meeting its financial obligations as and when they fall due. Insolvency occurs when the firm current assets are less than current liabilities.

### **2.3.2 The reasons for corporate failure**

Various factors might lead to corporate failure. As a result, the majority of the researches on corporate failure have tried to come out with the factors that might cause a corporation to fail. There are both internal and external factors that have a significant effect on the business organization. The

factors which are external to the business organization include competition amongst corporations operating in the same industry, overheads incurred in doing business, and insurance. However, the internal factors are internal to the organization and include difficulties in obtaining commercial credit, loss of consumers, business location, and administration errors during the day to day operations of the business. These factors affect the business which if not addressed might lead to corporate failure. For example difficulty in obtaining new capital, loss of the capital invested, and a high proportion of debt are called financial factors. More so high taxation can also impact the operation of the business and issues with tax authorities may also lead to corporate failure.

Bradley and Rubach (2002), also suggest that accidents and natural disasters might also lead to corporate failure.

Most financial experts and economists argue that the reason for the financial distress of business organizations happens predominately as an outcome of incapability or poor administration that does not have the expertise and experience to carry out the affairs of the business. More so, the occurrence of substantial debt burden and shrinking profits can occur in the period of financial and economic recession and high policy rate. Mbat and Eyo (2013), suggest that national rules and regulations as determinants of the sector and the operational structure of the business may have a significant influence on the business and might lead to financial distress. It is therefore suggested that there are so many factors both external and internal to the business organization which can lead to corporate failure.

### **2.3.3 Corporate Failure phases**

Business organizations undergo several stages before finally announcing corporate failure or collapse of its commercial activities. The most common and the oldest prominent corporate failure

prediction were undertaken by Argenti (1976), Ooghe, and De prijcker (2008). Argenti indicated that fail businesses experienced three different stages; they normally start successful business processes and end insolvent. Business defects are the first indication of corporate failure which comprises administration mistakes, shortage of skilled labor, administration weakness which includes authoritarian directors, and failure in the accounting system such as auditing and budgetary control. Mistakes and errors are the next trajectories of corporate failure as suggested by Argenti (1976). This occurs with time as a direct outcome of the defects of the first part of business failure, for example overtrading by the business establishment. The inability of the business organization to complete or fail to execute large projects and leverage, Errors and mistakes, and other factors such as dysfunction symptoms are known to be the first stage that might lead to corporate failures, such as deteriorating accounting ratios and creative accounting. In general, corporate failure stages may change from one corporate organization to another according to the age of the establishment (Laitinen 1993) or corporate failure of the sector in which the business operates (Bercovitz and Mitchell) or the size of the business organization (Thornill and Amit 2003; Ooghe and Deprijcker,2006). It can be seen from the above that corporate failure does not happen all of a sudden. In contrast, it starts when the establishment is in various stages or situations and hence getting worse up to the situation of corporate failure.

#### **2.3.4 Why corporate failure disclosure important**

Corporate failure might cause significant damages and huge financial costs to the economy and the entire society (Ahn, Cho, and Kim, 2000). Corporate failure disclosure is significant to both internal and external business entities which include customers, employees, government, investors, creditors, and business managers. It is therefore vital to address both non-financial and financial situations of the business organization (Ropega, 2011). This deterioration of business if not addressed might



cause the following: decrease in liquidity, sales reduction, and turnover (Koksal and Arditi, 2004, Ooghe and Deprijcker, 2006, Bednarski, 2001, Korol and Prussak, 2005; Argenti, 1976; Sharma and Mahajan, 1980). A business establishment with a high degree of debt portfolio (Korol and Prussak 2005 Argent, 1976; Koksal and Arditi,2004). Corporate organizations with a decrease in market shares (Crutzen and Van Caillie, 2007; Zelek, 2003) and disproportionate energy that is more than the capacity of the business organization (Bednarski, 2001, Ooghe and Deprijcker, 2006, and Zelek, 2001). Besides, there are two main reasons why it is important to detect corporate failure. Firstly, this comprises of the consequences, symptoms, and causes which help us to get to the origins of corporate failure and address them accordingly ( Ropega. 2011). Secondly, getting to the root cause of corporate failure through researching, this is obvious to prevent the collapse of the business, is it vital to address and correct the elementary reasons that lead to corporate failure.

#### **2.4 Prediction Model**

Many failure prediction models (Haldeman & Harayanan 1977, Beaver; 1996 Blum, 1974) are primarily based on monetary data, but no longer have many models consisted of non-financial variables (Lussier & Corman, 1995). These models are primarily based on several prediction fashions used with huge corporations due to ease of use and ease of getting entry to financial data. These fashions additionally include economic performance measures, and so not suitable for startups. This is the purpose why many prediction models in Ghana is based totally on a qualitative study on giant agencies (Amankwa-Amoah & Deborah, 2010), or quantitative by way of checking out and incorporating a particular tool the use of monetary data on massive corporations (Amoa-Gyarteng, 2014; Appiah, 2011; Gyimah & Boachie, 2018). The use of economic records for failure prediction has been questioned (Lussier & Corman,1991; Gilbert, Menon & Schwartz,1990), for

example, Appiah 2011 determined a couple of discriminant evaluation models be a terrible predictor of company failure in Ghana on listed corporations in Ghana due to type II error of 84.62%.

## **2.5 Quantitative Models**

A quantitative model is an approach that is utilized to produce mathematical figures and hard data, by the use of, logical, statistical, and arithmetical methods. Quantitative recommends the final direction of action. In quantitative research, the researcher's main goal is to examine relationships and variations linking two or greater variables (Barnharn, 2015). Quantitative take a look at the relationship between variables effect and cause. Quantitative research goals to explain phenomena by amassing numerical records and use mathematically based models to analyze the information (Matveev, 2002)

## **2.6 Qualitative Models**

The qualitative model is an approach of inquisition which builds a grasp of social and human sciences. Qualitative explores and discovers ideas used in the ongoing approaches and Qualitative structured strategies like questionnaires, observations, in-depth interviews, group discussions, and quantitative structured strategies such as surveys,. Qualitative builds on preliminary perception and quantitative recommends a closing path of action. In qualitative research, the researcher aims to understand a problem from the neighborhood populace who has experienced the problem being studied.

## **2.7 Empirical Review**

Research on corporate failure has step by step multiplied over the years. The problems of corporate failure are regularly eroding most gains and crippling commercial enterprise opportunities in Ghana

and Africa as a whole. Identification of early warning indicators of corporate failure in Banks can help managers to make prudent funding decisions and enforce preventive measures to safeguard the company. There are so many papers examining the vital drivers of failure in Ghana, Africa, and the World at large.

Kingsley Opoku Appiah (2011), investigated the predictability and the application of the Altman Z-score ratios model in predicting business failure in Ghana. The study sampled 15 failed and non-failed corporate organizations from the Ghana stock market, from 2004 to 2005. It was established that business failure cannot be predicted accurately in Ghana utilizing the Altman Z-score ratio model because of type ii error. It was however determine that failed companies can be distinguished from non-failed companies depending on the nature of the business and company's sizes.

Opoku Appiah Amon Chizema and Joseph Arthur (2015), Their study evaluate present literature to make contributions meaningfully to a better appreciation of methodology problems of statistical technique, synthetic talent expert device, and the theoretical method to fixing company failure prediction model. Their result suggests the necessary literature on the prior body on corporate failure prediction exists, it was, however, established that a theoretical sound, accurate, and popularly familiar failure prediction model for the corporate establishment for stakeholders has not yet be established. Data from 11 nations with 15%, 53%, and 11% statistics coming from Korea USA, and the UK in that order while, Belgium, France, and Australia accounted for only 4% and the rest of the World contributing 9%

Prince Gyimah, Kingsley O. Appiah and Robert N. Lussier (2019), failure versus success forecast model for medium and small business establishment in Ghana. The study tested the legitimacy of the Lussier model in forecasting the failure or success of medium and small business establishments in



Ghana. The study used the logic regression model to critically analyzed 107 successful businesses and 101 unsuccessful small businesses in Ghana. The research establishes the legitimacy of the Lussier model in predicting the failure or success of medium and small businesses in Ghana and therefore establishes these vital variables as being behind the success or failure of every business establishment in Ghana; capital, marketing skills, and economic timing.

Mahama (2015) evaluated the condition of financial distress of quoted companies on the Ghana stock market utilizing the Altman Z-score model. The sample consisted of 10 quoted companies' spanning from the period 2007 to 2013. The outcome of the research establishes that six out of the ten quoted companies were in the health zone with no sign of insolvency threats, while two of the business organizations determined to be in a distressed position financially. The two other companies were near distress. However, the two corporate organizations determined to be in the bankrupt zone having filed for bankruptcy.

Amoa-Gyateng (2014), Investigated the risk of business failure on AngloGold Ashanti, a company engaged in mining quoted on the Ghana Stock market and other stock markets around the world. The research the dataset between the period 2010 to 2012 using the Beneish and the Altman modified Z-score model. The outcome of the Altman modified model establishes that the entity was in the distress zone whereas the Beneish model establishes that the entity was not involved in any fraud financial reporting.

Samanhyia, Oware, and Anison Yaansah(2016) evaluated the financial distress position of quoted banks on the Ghana Stock market during the banking crisis in Ghana. The study examines dataset from the period 2008 to 2014. The research utilized the Boone indicator and the Altman modified model. It was established that smaller board size and poor corporate governance were the major

contributory factors in financial distress and have a negative correlation concerning business performance financially. The research determines the different aspects of the problem of corporate failure in Ghana.

Bimpong, P., Arhin, I., Danso, E., Opoku, P., Benedict, A., and Tettey, G. (2020), their research utilize dataset from Ghanaian quoted consumer services and goods from the period 2014-2018 to test the predictive power of Altman (2000), Taffler's (1983), and Beneish (1999) model in determining corporate failure and earnings manipulation. The outcome was that all the two models have essential predictive power. The Altman revised model was found to be accurate for quoted firms in Ghana at the predictive power rate of 66%. Taffler's(1983) Z-score were also found to be accurate with a predictive power of 88%. This indicates that the Taffler's model has the higher predictive rate in comparison to the Altman (2000) model. The Beneish (1999), model indicates that financial statements of the sector were manipulated at different degrees. The study further recommends that stakeholders will be protected when the three models are engage.

Musah A. and Aguirakwah, J. A, (2019),the study investigated the application of the Altman Z-score model to predict financial distressed of quoted companies on the Ghana stock market. 10 companies were sampled and one other for validation. The validation involves data from 2016 to 2017. The outcome indicated that 50% of the firms were correctly predicted whereas the others were misclassified. Additional investigation indicated the firm size influence the possibility of bankruptcy and hence the Altman Z-score cannot accurately predict corporate failure in Ghana but can be useful in showing signals.

Ally, O., J and Bwana K.,M. (2019), their study applies multi-Discriminant Aanalysis (MDA) which engage both consolidation of effect from ratios that establish the main aspect of financial health. The

study sampled 6 manufacturing companies quoted on the Dar rs Salaam stock market with dataset between 2010-2014. The study establish that five companies were financially sound (that is Z-score above 2.99), while the rest were not financially sound (that Z-score below 1.88). The research outcome indicates that management has to pay attention to variables which are sensitive with regards to financial health of the company

A study carried out by Pam (2013) in the banking sector of Nigeria focusing on two failed banks and two non-failed banks revealed that liquidity, profitability, running efficiency, and complete assets turnover had been key ratios of the Altman's Z Score model are necessary tools in organizing the strength of a financial organization.

Mohammed & Soon (2012) applied the Altman's Z score ratios model in predicting company failure and modern ratio to examine the economic circumstance of 44 companies that were listed in the Malaysian Stock Exchange from 2008 to 2010 and the study results concluded that the Altman's Z rating model and the present-day ratio are exact predictors of corporate failure of firms.

Ntoiti (2013) did a study to find out about the determinants of monetary failure facing local authorities in provider shipping in Kenya. The study concludes that the financial management of local authorities in Kenya is negative and ineffective which led to the monetary failure being witnessed in nearby authorities in Kenya.

Onyeiwu (2012) examined the applicability of the Multi Discriminant Analysis (MDA) to manufacturing businesses in Nigeria. The result concludes that the application of more than one discriminant analysis used to be applicable and dependable to the Nigerian environment.

Lake (2013) investigated the influence of the financial hazard of business profitability banks in Ethiopia by the usage of Ordinary Least Square (OLS) for the length of (2011). The consequences of



the study mounted that deposit and liquidity risk was great and statistically, had a terrible association with the banks' profitability.

Omete, Asakania, and Amawavi (2015) investigated the effect of financial health and going concerned with a business entity using Mumias Sugar Company as a case study using data set from the period 2003 to 2011. The research result indicated that the entity was in the grey zone and therefore signs of business failure.

Kungu (2015) investigated financial failure and creative accounting using the Altman Z-score model and data set from 2009 to 2013 utilizing Mumias Sugar Company as a case study in this research. The result of the research indicated that the business entity was in the financial distress threshold.

Bhatt (2012) evaluated the capacity of three kinds of models for business failure prediction using companies quoted on the Indian stock exchange. The research sampled four selected business organization on the Indian stock market from various industries. The research establishes that the various models have a high degree of legitimacy and accuracy in forecasting business failure.

Alharib and Bzour (2011), examine the applicability and predictability of business failure of quoted companies on the Jordanian stock Exchange utilizing the Altman Z-score model. The research sampled quoted companies on the Jordanian stock exchange which were liquidated from 2000 to 2006. The research revealed that the Altman Z-score model was a legitimate and efficient model for forecasting business failure of quoted Jordanian companies during the period of the study.

Rijken (2011), suggested that nations with risk default rate on its sovereign debt may be assessed by an expert in its industry sector

Li and June (2012), investigated the degree of accuracy of the various kinds of the Z-score ratio model by Altman in forecasting business failure between the period 2000 to 2010 in the United States of America. The research revealed that even though the Altman original Z-score model was purposely developed for industries in the manufacturing sub-sector, it can be used to predict corporate failure of non-manufacturing companies as well.

Fitscherin and Pillanias (2012), examined Indian companies, their study revealed that financial changeability might be examined utilizing principles which implied to maintain the effectiveness in the cost accounting system, distribution systems, and management accounting practices since the firm was able to control operating expenses and cost of goods sold, have a high possibility of increasing their cash flow position, net worth, profits and reducing the problem of the agency which in turn reduce bankruptcy.

Johnson and Kumbro (2011) conducted their research using multiple discriminating analyses. They sampled 45 companies in the United States of America that filed for liquidation from 2007 to 2010. The research utilized the Z-score ratio model by Altman. It was established that the Altman Z-score model was a reliable tool for predicting business failure.

### **2.6.1 Review of contributing elements of the Altman model**

There are several important acknowledged confirmation of research on the accuracy and legitimacy of the Z-score ratio model by Altman in predicting business failure and financial distress (Li, 2012). For example; Wang and Campbell,(2010), Xu and Zhang (2009), Gerantonis et al (2009), Lugovskava (2010), and Janakiram (2011), Wang, Li and Rahgoza (2012), Alzaabi (2011), Girzeit and Yozzo (2011). However, the Z-score ratio model by Altman is not free from criticism: Many researchers have criticized the Altman Z-score model. For instance, Shumway (2001) designed a

hazardous technique and criticized the Altman Z-score ratio model. Also, research conducted by Campbell, Hilscher, and Siglarvi (2011), used a similar methods and techniques as used by Shumway (2001), following the same reasoning. Shumway however outperformed the rest as being the first model that examined the weak performance of shares in distressed. Li (2012), assert that they all unanimously agreed to blame the Z-score ratio model by Altman based on the modeling and the ratios used. According to Hillegeist et al (2004) and Gharhori et al (2006) the Z-score ratio model by Altman consist of several accounting and financial variables measures that are drawn from the income statement and statement of financial position. It may have relied on the financial statement which does not establish any predictive power for the company's future. More so it relies solely on one of the accounting and financial variables as  $X_4 = \text{market value of equity} / \text{total liability}$  as a means of postulation to recognize business failure. Additionally, a further setback of the Z-score ratio model by Altman is that it does not include the measure of the volatility of assets. Hillegeist et al (2004), put forward that volatility is an important to factor that measures the value of the company to meet up its financial obligation as and when they fall due. Also, Ingram and Grice (2001) suggested that the Z-score ratio model by Altman performs better in the prediction of business failure in the manufacturing sub-sector than the non-manufacturing sub-sector. Similarly, Begley et al (1996), assert that the Z-score ratio model by Altman is more precise in predicting business failure in U.S.A companies in a certain period than others.

### **2.6.2 Review of the Altman Z-score model**

To understand the efficiency of the Altman Z-score or as an alternative the cut-off points, an analysis is necessary. This intuition was backed by means of Altman himself, when he claimed that the Z-scores have been altering year over 12 months on a Z-score golden jubilee interview tournament (Larry Cao, CFA, CFA Institute, 2019). To conduct the analysis, the Z-scores for every

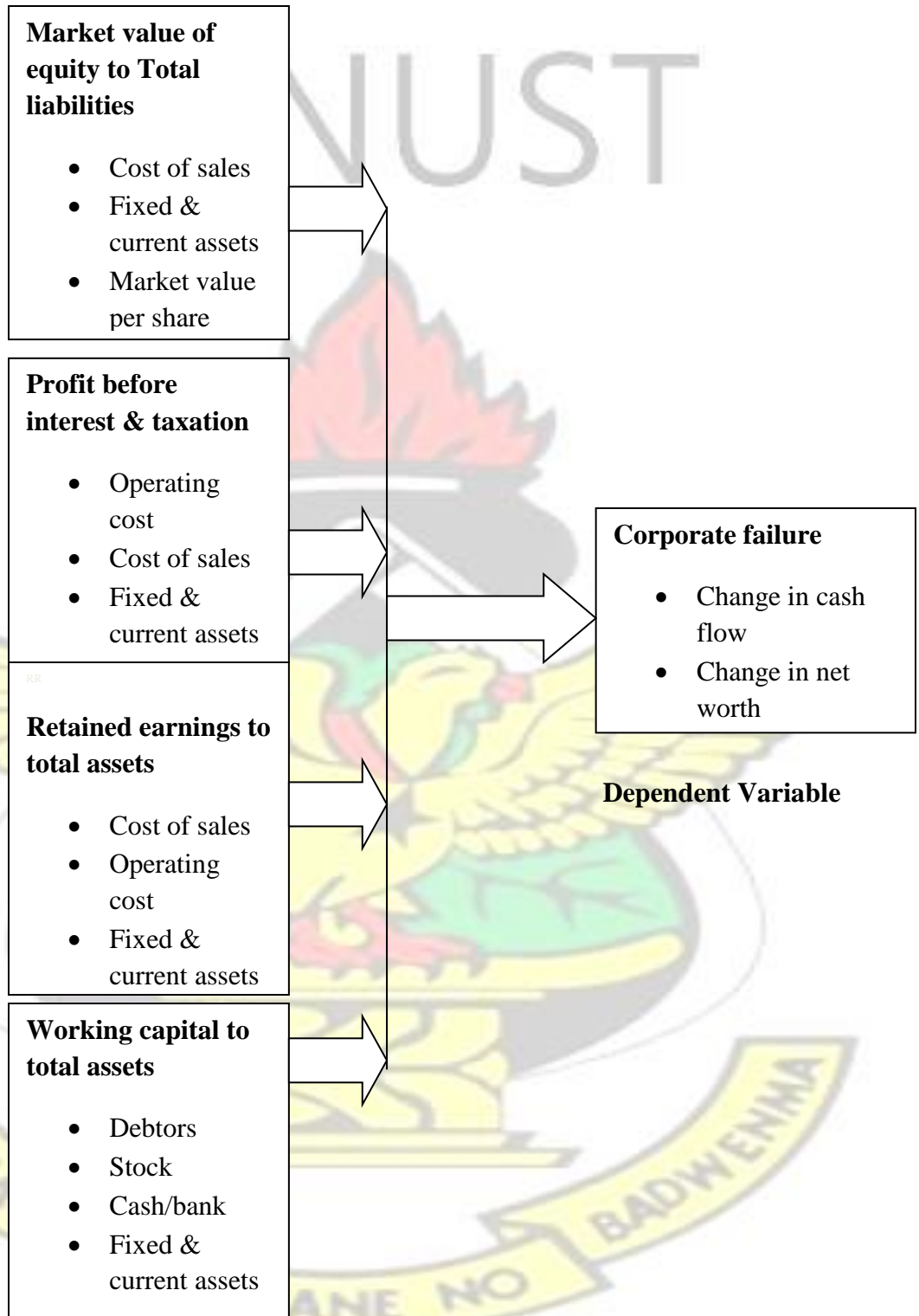


year beginning from 2003 to 2017 had been compiled and statistical operations were carried out to discover the mean, median, popular deviation, and kurtosis. The kurtosis was in particular used instead of skew since the “tailedness” of the facts used to be given extra importance due to outliers.

## **2.7 Conceptual framework of the study**

According to Young (2009), a conceptual framework is defined as a diagrammatical illustration of variables that indicates the association connecting the independent variables and dependent variables. In this research, the conceptual framework has looked at the association connecting corporate failure (dependent variable) and the Altman emerging market Z-score ratios (independent variable) of Banks in Ghana. Besides, Camp (2001) explains the conceptual framework as construction that the researcher believes can best make clear the natural development of the phenomena being studied. Furthermore, the conceptual framework presents an incorporated way of investigating a problem under study (Lichr and Smith, 1999). More so, a conceptual framework describes the connection linking the main concepts of the research, it is given in a more rational construction to make available a picture or diagram display of how ideas in the study are associated with one another (Grant & Osanloo 2014). A conceptual framework is the simplest means by which the investigator presents the asserted remedies to the problem being studied (Lichr, Smith and Akitonye, 2015).

**Figure 1 Conceptual Framework of the study**



### **2.7.2 Working Capital to Total Assets Ratio**

The working capital is the difference between current assets (inventory, debtors, prepayments, and cash) and current liabilities (account payables, short term loans, wages payable, and tax dues). The presence of positive ample working capital is an indication of quick solvency. Besides, it will be an indication that the organization is in all likelihood to meet its short-term obligations (Bhurnia & Sarkar, 2011).

According to Baker (2012), one of the monetary tools that are widely used in analyzing and evaluating economic statements is ratio analysis. This evaluation now not only assists in the comparison of the company's overall performance but also offers room for a high-quality comparison of the performance of the company from one, duration to other, and also with those of comparable companies. Working capital is a company's cutting-edge belongings much less its current liabilities and measures a company's efficacy and its non-permanent financial health. Petersen and Plenborg (2012), state that an establishment will no longer be in a position to meet its short-term responsibilities when they fall due if it is not liquid. Liquidity is affected by the firms' ability to generate enough net cash inflows in both the short term and long term.

### **2.7.3 Use of Retained Earnings to Total Assets Ratio**

Retained revenue is an essential factor of Altman's Z score ratio model because; it measures the company's overall profitability over time (Gibson, 2011). The retained earnings of an organization are the share of interest earnings no longer paid out as dividends (Chan, 2012). They are reinvested in the organization or used to pay the debt of the firm. Retained revenue is calculated as follows:  $\text{establishing retained earnings} + \text{net income (net loss)} - \text{dividend paid}$ . Retained Earnings are

retained income that the company does not pay as dividends but set aside for future expansion (Horkan, 2014).

According to (Pranowo et al., 2010) a company's efficiency measures how efficiently the enterprise utilizes its assets to generate returns. Those quoted banks on the Ghana stock market can use their assets to generate enough returns which are expected to increase cash flow, profitability, retained earnings, and decrease agency problems that will decrease external borrowing and therefore reduce business failure likelihood. The ratio of retained earnings to the total assets helps to measure the degree to which a business depends on debt because an organization with high debts will have low retained earnings due to excessive interest payment (Stewart, 2011). This additionally indicates that the total assets of the organization are generally financed via debt capital. The lower the ratio, the more a corporation is funding its asset through borrowed funds alternatively of retained earnings which again increases company failure due to the fact the company will not be in a position to meet its debt duties as and when they fall due (Altman, 1968). Retained earnings to total assets ratio, therefore, measure the potential of the association to accumulate income the usage of its belongings (Gibson, 2011). The more the retained salary the agency has, the greater the investments (Campbell, Hilscher, and; Ssikggi, 2012). Firms with greater total assets, low retained profits will be an indication that the organization is now not utilizing nicely its total assets to generate revenues as a signal of ineffective management or the total assets may additionally be overstated or they may additionally have turned out to be obsolescent. Consequently, the higher the Z-score ratio the better as it is an indication that the firm is capable of amassing earnings. Retained income or profits have an advantage to the company by means of making capital handy for future increase (Altman, 1968). Improvements and enlargement are highly-priced but essential for the company to remain competitive. Firms want to search for market segments within the enterprise that provide



opportunities to seize market fees which make bigger sales, profitability, and cash flows hence, increasing the cost of the EM Z-score ensuing into a discount in the company's failure.

### **2.7.3 Use of Earnings earlier than Interest and Taxes to Total Assets Ratio.**

Profit before taxation and interest (PBIT) to total assets ratio evaluates the company's capacity to generate enough profit from its operating assets before deductions for taxation and interest, this ratio is classified as a profitability ratio that normally utilized as a means of determination of management efficiency in utilizing organization assets (resources) to generate enough income (Pervan, Pervan and Vukoja, 2011). This is based on the fact that a company's ultimate going concern is determined by the profitability ability of its operating assets. This Z-score ratio appears more appropriate for research on corporate failure likelihood. An increase in this ratio is an indication that there is an increase in income or reduction in the cost of doing business which ultimately reduces business failure (Taylor, 2008). Profit before taxation and interest to total assets ratio of the business indicates the proportion of total assets left after deductions of all operating costs which is incurred in the normal course of the business (Cornett et al, 2012). An increase in profit before taxation and interest to total assets ratio indicates that the business is efficiently and effectively controlling the cost of operations (Palenu and Healy, 2008), which in this research had a positive effect of increasing profits levels and cash flow and therefore reducing business failure.

### **2.7.4 Market value of equity to total liability ratio**

Altman (2002), explains market value as addition of both common and preferred stock, the fundamental estimator of the company's net worth suggests the price variation may foreshadow pending problems if a firm's total liabilities exceed its market value of equity. A higher gearing ratio is probable to make bigger borrowers safety charges and claim on the firm's cash flows

which will decrease profitability and increase the level of company failure (Saunders and; Cornett, 2011).

### **2.7.5 Corporate failure**

Aliabari (2009) explains bankruptcy as the inability of a business establishment to repay its debt when they fall due. Recognition of early warning systems in business failure in corporate organizations will help management to make prudent financial decisions and choices that will put into operation preventive measures to protect the organization. Telmoudi et al (2011), suggest that early forecast of business failure may aid to avoid high social cost which affects people who have an interest in the operations of the business. Corporate organizations are always in a position to come out with countermeasures for undesirable conditions where business failure plays a significant role for the reason that it has an important influence on the cash flow, profitability, and net worth of the company as a unit and therefore affects the stakeholders who have interest in the continued existence of the business. Corporate failure serves as a timely early warning system for stakeholders to take corrective measures of actions to save the business from failing. Simic. Kovac and Simic (2012), suggest that corporate failure prediction is important for the avoidance or mitigation of negative effects with regards to economic fluctuations in the country economy since insolvency decrease productivity and has a negative influence on Gross Domestic Product that reduce the nation's ability to borrow and its ability to repay its debt to lenders. This is because an economy such as Ghana depends greatly on loans for its infrastructural needs.

### **2.8 Chapter Summary**

The chapter reviewed the exclusive theories that defined the independent variables (retained earnings to total assets, working capital to total assets, earnings before interest and tax to total assets, the



market value of equity to total liabilities and book value of equity or market value of equity to total liabilities ratios and established variable which is the corporate failure of banks quoted on the Ghana Stock Exchange. The theories have been identified in line with the independent variables. The chapter also explores the conceptualization of the impartial and the structured variables by analyzing the relationships between the two units of variables. Besides, an empirical overview has been performed where previous research both local and global has been reviewed and critiqued in line with this study.



## CHAPTER THREE

### RESEARCH METHODOLOGY

#### 3.1 Introduction

The chapter provides deliberation on the research that is: research design, target population, sampling technique, and sample size. Besides, the chapter provides data collection instruments and data collection procedures.

#### 3.2 Research Design

The quantitative method is adopted in this research for the reason that it helps to comprehend the best prediction of outcome (Creswell, 2012). Cooper and Schindler (2008), explain that a research design is a plan structure that the researcher uses to carry out its research to get the most out of the validity of the findings. It gives the direction from the underlying principle to research design and data collection.

The principle of this research is to confirm the validity of the Altman emerging market z-score ratio as a forecaster of business failure in the case of banks quoted on the Ghana Stock market. The study used four year's financial statements of Banks in Ghana.

This duration of 4 years was considered adequate by the researcher for establishing the corporate failure of Banks in Ghana. Besides, this is in line with Kirkham (2012) who argues that trends in the evaluation of financial ratios are probably to set up movements and modifications in these actions in the normal overall performance of the company.

The study used descriptive research designs. Creswell, (2011) suggests that descriptive research is deemed necessary when it ensures a complete description and analysis of events and transactions by

making sure that there is minimum bias in the data collection and analysis stage. Besides, a descriptive research layout assists the researcher in answering questions such as what is the problem, the place the problem is, and how the problem is. Previous studies used the same research design includes; Kingsley Opoku Appiah (2011), who investigated the predictability and the application of the Altman Z-score ratios model in predicting business failure in Ghana. The study sampled 15 failed and non-failed corporate organizations from the Ghana stock market, from 2004 to 2005. It was established that business failure cannot be predicted accurately in Ghana utilizing the Altman Z-score ratio model because of type ii error. It was however determine that failed companies can be distinguished from non-failed companies depending on the nature of the business and company's sizes. Samanhyia, Oware, and Anison Yaansah (2016) evaluated the financial distress position of quoted banks on the Ghana Stock market during the banking crisis in Ghana. The study examines the dataset from the period 2008 to 2014. The research utilized the Boone indicator and the Altman modified model. It was established that smaller board size and poor corporate governance were the major contributory factors in financial distress and have a negative correlation concerning business performance financially. The research determines the different aspects of the problem of corporate failure in Ghana.

### **3.3 Target Population**

A targeted population is explained as a large compilation of individual persons, companies, objects which form the main focus of methodical research, and the research is done for the benefits of the targeted population (Castillo 2009). Additionally, targeted population refers to lay down events, transaction, things, services, Households and companies which are being examined to determine findings which are used for decision making (Cooper & Schindler, 2014; Kothari, 2004). The targeted population for this research consists of Banks in Ghana.

### **3.4 Sampling Techniques and Sample Size**

The sampling method utilized in this study is purposive sampling which refers to choosing a unit among a population of items that is based on a certain specific principle either than at random. (Tashakkori & Teddlie 2003). Babbie (2008), suggests that the population is referred to as a collection of elements or cases be it individuals, objects, or procedures which match specific criteria and about whom conclusions are drawn. From a population of 23 banks, the researcher utilized a non-probability sampling method in selecting banks for this study. The researcher analyzes a sample of 12 Banks from 2015 to 2019. 12 banks were selected because of the availability of data for the relevant years of the study, which also account for more than 10 percent of the population.

### **3.5 Method of Data Collection**

The dataset for this research consist of secondary data from published financial statements of the 12 Banks for four years from 2015 to 2018 and comparing these to 2019 financials. The secondary data utilized was deemed useful for this study because the objectives of the research were to model the use of the Altman emerging market Z-score model to predict the business failure of banks in Ghana. According to Cooper and Schindler (2014), secondary data enables the researcher to interpret the events and transactions recorded in the financial statements hence enhancing comparability and forecasting of the financial information for decision making. Additionally, Polit and Beck (2010), also argue that secondary data analysis is reliable, efficient, and economical for a research project. Bernard (2002), suggests that the data collection stage is vital for every research for the reason being that data is meant to add to an enhanced comprehension of the theory under review. Bernard (1986), argues that it then becomes imperative to choose the ways and manner of gathering data and where it is gotten from and from whom it is obtained from should be done with sound judgment, especially because no amount of investigations can make up for improperly collected dataset.



### 3.6 Data Analysis Techniques

In this research, the data was gathered and analyzed with the aid of the Microsoft word Excel computer package. That is each of the accounting variables on the emerging market Z-score ratio model by Altman formula was computed by the use of this computer software. However, the word package Microsoft word Excel was used to obtain the financial distress level of the 12 Banks in Ghana in the study. The three distress levels according to Altman are the safe zone, the grey zone, and the distress zone. The four main accounting variables covered by the Altman emerging market Z-score model are: gearing, profitability, efficiency, and liquidity ratios were modeled utilizing discriminate analysis and result adopted by the study to predict corporate failure of banks in Ghana.

The emerging market Z-score model=  $3.25+6.56(X1) +3.26(X2) +6.73(X3) +1.05(X4)$

X4= market value of equity to total liabilities ratio

X3=Profit before interest and taxation to total assets ratio

X2=Retained earnings to total assets ratio

X1=Working capital to total assets ratio

The discriminating Z-score ratio value was linear groupings of four ordinary accounting ratios where the liquidity ratio was used as the predictor value of each of the year. The discriminating emerging market Z-score ratio was identified as follows:

Safe if greater than 2.60

Grey area between 2.6 and 1.10

Bankrupt if less than 1.10



### **3.7 An Overview of the banking sector in Ghana**

The banking industry in Ghana consists of the Bank of Ghana as the body in charge of regulating banks in Ghana, 23 universal banks, and 140 rural and community banks (2019 banking survey), with 14 of the universal banks foreign-owned and 9 local owned. The current universal banking system was introduced in the year 2003. With this system in place banks in Ghana can undertake can perform investment, commercial, merchant, and undertake development with a single banking license. The reason for this system was to make sure that banks are versatile in providing banking services to their customers (Quartey & Afful-Mensah). In the year 2006, the Bank of Ghana abolished the secondary reserve requirement; this was to enable the banks to make funds available for loan purposes. This policy mandated banks to have a percentage of deposits in the form of medium securities. To enable banks to perform their duties as expected the Bank of Ghana increased the minimum capital requirement to 400 million Ghana cedis on 11<sup>th</sup> September 2017 to make sure that banks were adequately capitalized in Ghana. After the deadline for compliance which was December 2018, the number of banks declined from 34 to 23 banks that operated as universal banks in Ghana representing a 32% decline. The license of Unibank Ghana Limited, Beige Bank, and Royal Bank was revoked by the Bank of Ghana due to insolvency while Construction banks and Sovereign bank licenses were revoked because of pretense. The six other banks exited the system or merged with other banks while Premium bank and Heritage bank licenses were revoked due to insolvency. Bank of Baroda (BOB) exited the banking sector voluntarily. The Bank of Ghana approves three merges that involved six banks.

### **3.8 Chapter Summary**

This chapter provides a thorough justification of the method adopted by the study in attaining the objectives of the research. This put together clarity on population and sample size, research design,

research instrument, the validity of research instrument, data analysis technique, and an overview of the banking system in Ghana.

# KNUST



## CHAPTER FOUR

### DATA ANALYSIS, PRESENTATION, AND DISCUSSION OF RESULTS

#### 4.0 Introduction

The rationale of this chapter is to construe the result of the financial data obtained from the banks websites, which were analyzed using the Altman emerging market Z-score method. The findings relate to the research questions and secondary data which guided the study were offered as descriptive and inferential statistics, figures and tables were also used. The secondary data were analyzed using discriminating analysis by applying the four key ratios of the Altman emerging market Z-score model that consist of: earnings before interest and tax to total assets, retained earnings to total assets, working capital to total assets, and the book value of equity to total liabilities were computed with the assistance of Microsoft word excel. The ratios cover the liquidity situation of the business, efficiency or assets utilization, leverage situation, profitability position, and market ratio. The study modeled these ratios with the assistance of Microsoft word excel to establish their weights concerning discriminating ability in terms of corporate failure rate.

#### 4.1 Data Analysis of 12 Banks for the Study

##### 4.1.1 GCB

The incorporation of this corporate organization was in 1965 within Ghana. From its most up-to-date financial report from the table below (table 1), there have been considerable increases in income and total assets in the year 2015 in comparison to 2019, both however remained high. Additionally, there was a rise in assets and retained earnings from GHS 4,659,181 and GHS 545,721 in 2015 to GHS 12,524,084 and GHS 828,873 in 2019, therein order. Furthermore, earnings before interest paid

decreased from GHS 466,994 in 2016 to GHS 331,983 in 2017, it appreciated marginally to GHS 573,668 in 2019 from GHS 450,174 in 2018. As a consequence, the bank's emerging market Z'-score ratio index declined from 5.325 in 2016 to 4.603 in 2017 and so from 4.616 to 4.737 in 2018 and 2019 respectively. Nevertheless, this corporate organization continues to be within the low-risk zone, which is an indication that there is a low likelihood of insolvency or bankruptcy. All the same, this analysis provides an insight about the bank performance, which is quoted on the Ghana securities market, therein while the superior scores of 5.393 and 5.324 achieved by GCB in 2015 and 2016 in that order and, the emerging market Z-score tended sharply decline within the successive years, this demands urgent attention by executives, the board and management to come out with the factors that are influencing the negative change in the ratios, these factors if left unaddressed may cause company failure or bankruptcy.

**Table 1: EM Z-Score of GCB**

<b>Financial year</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Receivable	1,493,230	1,412,977	2,099,330	2,799,041	3,587,653
Investment	7,639	2,626,946	4,884,277	4,646,034	6,025,382
Cash	544,683	1,179,975	1,022,684	1,953,620	1,572,538
Fixed assets	139,889	191,062	222,861	237,247	272,342
Total assets	4,659,181	6,074,533	9,627,061	10,720,925	12,524,084
Current assets	4,519,292	5,883,471	9,404,200	10,483,678	12,251,742
Current liabilities	3,805,209	5,014,705	8,412,902	9,271,181	10,743,722
Retained earnings	545,721	759,477	870,198	585,167	828,873
Shareholders fund	853,972	1,015,113	1,214,159	1,449,744	1,780,362
Total income	863,291	1,071,054	1,124,013	326,741	428,457
Total expenses	425,752	588,410	756,938	259,103	301,803
Total liabilities	3,805,209	5,014,705	8,412,902	9,271,181	10,743,722
Profit before tax	360,801	466,994	331,983	450,174	573,668
Income tax	88,645	126,539	81,940	123,433	145,211
Profit for the year	254,642	318,116	234,598	326,741	428,457
Earnings/share	0.96	1.2	0.89	1.23	1.62
X1	0.1532636	0.143018	0.10297	0.1130963	0.1204096
X2	0.1171281	0.125026	0.0903908	0.0545818	0.0661823
X3	0.0774387	0.076877	0.0344844	0.0419902	0.0458052
X4	0.2244218	0.202427	0.1443211	0.156371	0.1657118
<b>EM Z</b>	<b>5.3932781</b>	<b>5.324947</b>	<b>4.603429</b>	<b>4.6162122</b>	<b>4.7374497</b>
<b>Original Z</b>	<b>0.7380966</b>	<b>0.72181</b>	<b>0.4505021</b>	<b>0.4445204</b>	<b>0.487731</b>



**Table 2 EM Z-Score of CAL**

<b>Financial year</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Receivable	1,806,115	1,966,394	1,853,674	2,422,952	2,920,026
Investment	291,538	1,486,97	818,032	2,710,691	1,815,912
Cash	244,424	428,756	512,376	637,570	597,784
Fixed assets	130,201	278,810	252,332	504,242	435,583
Total assets	3,351,039	3,618,858	4,223,138	5,419,299	7,048,498
Current assets	3,220,838	3,366,526	3,944,328	4,204,271	6,544,332
Current liabilities	2,845,176	3,099,355	3,551,068	4,639,854	6,073,711
Retained earnings	206,509	0	0	73,666	189,473
Shareholders fund	505,863	519,503	672,070	779,445	974,787
Total income	388,415	10,208	152,989	153,216	173,413
Total expenses	139,597	243,369	350,126	296,351	353,452
Total liabilities	2,845,176	3,099,355	3,551,068	6,073,711	4,639,854
Profit before tax	213,197	17,051	218,863	222,906	242,940
Income tax	42,495	6,843	65,965	69,690	69,527
Profit for the year	160,042	10,208	152,898	153,216	173,413
Earnings/share	0.2919	1.87	24.49	24.49	27.73
X1	0.1121031	0.073827	0.0931203	-0.080376	0.066769
X2	0.0616254	0	0	0.0135933	0.0268813
X3	0.0636212	0.004712	0.0518247	0.0411319	0.0344669
X4	0.1777967	0.167616	0.1892586	0.1283309	0.21009
<b>EM Z</b>	<b>4.8005161</b>	<b>3.941968</b>	<b>4.407853</b>	<b>3.1781995</b>	<b>4.2278498</b>
<b>Original Z</b>	<b>0.5374272</b>	<b>0.204711</b>	<b>0.3963211</b>	<b>0.1353129</b>	<b>0.3575515</b>

#### 4.1.2 Cal Bank Limited

This bank was established in 1990 in Ghana. From its most up-to-date financial report from the table above (table 2), there have been significant increases in income and total assets from 2015 through to 2019. More so, there was a rise in assets and retained earnings from GHS 3,315,039 and GHS 388,415 in 2015 to GHS 7,048,498 and GHS 173,413 in 2019, therein order. Additionally, profits before interest paid increase from GHS 213,197 in 2016 to GHS 242,940 in 2019. As a result, the bank's Altman emerging market Z'-score index decrease from 4.805 in 2015 to 4.228 in 2019 respectively but still within the safe zone. There was however a decrease in emerging market Z-score from 4.805 in 2015 to 3.942 in 2016. However, this bank remains within the low-risk region, which is an indication that there is an occasional possibility of insolvency. All the same, this analysis provides insight into the bank's performance quoted on the securities market, in this although the

higher scores achieved by Cal Bank in 2016 and, the emerging market Z-score tended to decline sharply within the following years, this case demands urgent attention by top management to indicate the factors causing this to stop failure and bankruptcy.

**Table 3: EM Z-score of RBGI**

<b>Financial year</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Receivable	861,877	919,436	809,736	1,175,066	1,401,224
Investment	23,498	28,376	54,549	50,428	568,866
Cash	139,747	642,944	846,357	905,652	1,136,757
Fixed assets	57,919	65,545	67,250	64,908	93,046
Total assets	1,566,419	1,897,556	2,100,178	2,879,034	3,326,242
Current assets	1,508,500	1,832,011	2,032,928	2,814,126	3,251,499
Current liabilities	1,386,664	1,749,958	1,852,901	2,374,560	2,764,868
Retained earnings	-13,475	0	0	0	0
Shareholders fund	179,755	145,097	238,635	500,170	574,793
Total income	26,761	-47,729	272,753	297,668	342,962
Total expenses	135,676	265,382	203,329	259,018	231,658
Total liabilities	1,386,664	1,749,958	1,852,901	2,374,560	2,764,868
Profit before tax	-37,079	-63,782	69,445	38,650	111,294
Income tax	2,162	16,446	19,690	8,011	26,589
Profit for the year	-39,241	-47,729	46,494	28,201	79,123
Earnings/share	-13.19	-16.13	5.04	15.49	9.19
X1	0.07778	0.043241	0.0857199	0.1526783	0.1463005
X2	-0.008602	0	0	0	0
X3	-0.023671	-0.03361	0.0330662	0.0134246	0.0334594
X4	0.1296313	0.082915	0.1287899	0.2106369	0.2078917
<b>EM Z</b>	<b>3.709235</b>	<b>3.394847</b>	<b>4.169757</b>	<b>4.562952</b>	<b>4.6528648</b>
<b>Original Z</b>	<b>0.0809564</b>	<b>0.540968</b>	<b>0.8119825</b>	<b>0.8275153</b>	<b>0.8859766</b>

#### 4.1.3 Republic Bank Ghana Limited

This bank commences business within the year 1990 in Ghana. From its most up-date financial report from the table above (table 3), there have been major increases in total assets and income from 2015 through to 2019. More so, there was a rise in assets from GHS 1,566,419 in 2015 to GHS 3,326,242 in 2019, respectively. Additionally, profits before interest paid increase from GHS (37,079) in 2016 to GHS 111,294 in 2019. As a result, the bank's Altman emerging market Z'-score

index increased from 3.94 in 2016 to 4.22 in 2019 respectively. There was however a decrease in emerging market Z-score from 3.709 in 2015 to 4.653 in 2019. However, this bank continues to be within the low-risk region, which is an indication that there is an occasional possibility of insolvency. All the same, this analysis provides insight about the bank performance quoted on the stock market; in this, while the upper scores achieved by Republic bank Ghana Limited in 2015 and, the emerging market Z-score tended increased constantly within the subsequent years.

#### **4.1.4 Agricultural Development Bank**

This bank was incorporated within the year 1965 within Ghana. From its most up-to-date financial report from the table below (table 4), there have been considerable increases in total assets and a decrease in income from 2015 to 2019, there was a rise in assets and a decline in income from GHS 2,134,147 and GHS 273,081 in 2015 to GHS 3,853,023 and GHS 112,572 in 2019, in this order. Additionally, profits before interest paid increase from GHS (100,197) in 2016 to GHS 23,652 in 2019. As a result, the bank's Altman emerging market Z'-score index increased from 3.735 in 2015 to 4.467 in 2019 respectively. Conversely, this bank continues to be within the low-risk region, which is an indication that there is a low possibility of bankruptcy. All the same, this analysis provides insight into the bank performance quoted on the Ghana stock market.

**Table 4 EM Z-Score ADB**

<b>Financial year</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Receivable	1,088,071	1,005,302	1,139,356	1,068,814	1,216,631
Investment	374,496	1,085,752	1,099,177	1,189,749	1,203,468
Cash	483,967	610,563	951,675	652,828	728,384
Fixed assets	108,076	105,015	105,117	98,846	96,382
Total assets	2,134,147	3,035,493	3,545,143	3,597,395	3,853,023
Current assets	2,026,071	2,930,478	3,440,026	3,498,549	3,756,641
Current liabilities	1,801,254	2,580,715	3,066,130	2,957,684	3,193,486
Retained earnings	-35,386	0	0	0	0
Shareholders fund	332,893	454,778	479,013	639,711	659,538
Total income	273,081	278,457	26,510	5,908	112,572
Total expenses	153,910	383,961	359,565	353,420	88,920
Total liabilities	1,801,254	2,580,715	3,066,130	2,957,684	3,193,486
Profit before tax	-100,197	-105,714	47,339	34,057	23,652
Income tax	21,222	35,688	-20,829	-28,149	2,826
Profit for the year	-78,975	-70,026	25,510	5,908	20,826
Earnings/share	-3.159	-1.66	11	2.56	9
X1	0.1053428	0.115224	0.1054671	0.1503491	0.1461593
X2	-0.016581	0	0	0	0
X3	-0.046949	-0.03483	0.0133532	0.0094671	0.0061386
X4	0.1559841	0.176222	0.1562272	0.2162878	0.206526
<b>EM Z</b>	<b>3.7352782</b>	<b>3.956875</b>	<b>4.1956364</b>	<b>4.5270112</b>	<b>4.4669082</b>
<b>Original Z</b>	<b>0.0418555</b>	<b>0.129077</b>	<b>0.2643624</b>	<b>0.3414331</b>	<b>0.319564</b>

#### 4.1.5 Eco Bank Ghana Limited

The incorporation of this corporate organization was in 1990 in Ghana. From its most up-to-date financial report from the table below (table 5), there have been substantial increases in income and total assets in 2015 compared to 2019, both remained high. Additionally, there was a rise in assets from GHS 991,810 in 2015 to GHS 10,937,674 in 2019, respectively. Moreover, earnings before taxation and interest paid declined from GHS 458,560 in 2015 to GHS 306,784 in 2019. As a result, the bank's Altman emerging market Z'-score index declined from 4.629 in 2015 to 4.273 in 2019 respectively. All the same, this establishment remains within the low-risk zone, which is an



indication that there is the occasional likelihood of insolvency. However, this analysis provides insight about the bank performance quoted on the Ghana stock market, despite the very fact that the superior scores attained by EGH in 2016 and, the EM Z-score tend to sharply decline within the succeeding years, this demands urgent attention by executives, the board and management to come out with the factors that are influencing the negative change in the ratios, these factors, if left unaddressed, may cause company failure or bankruptcy

**Table 5 EM Z-Score of EGH**

<b>Financial year</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Receivable	3,117,873	3,480,544	2,685,468	4,149,511	4,624,270
Investment	0	0	0	0	0
Cash	772,942	3,193,202	2,952,753	2,443,686	2,711,120
Fixed assets	252,833	316,661	456,006	443,016	454,622
Total assets	6,691,810	8,056,870	9,098,038	10,454,765	10,937,674
Current assets	6,438,977	7,740,209	8,642,032	10,011,749	10,483,052
Current liabilities	5,802,057	7,092,794	8,061,213	9,128,546	9,382,110
Retained earnings	272,852	0	0	0	0
Shareholders fund	889,753	964,076	1,036,825	1,326,219	1,555,564
Total income	1,023,129	1,206,657	1,116,846	1,307,498	729,919
Total expenses	565,601	744,958	759,207	803,003	423,207
Total liabilities	5,802,057	7,092,794	8,061,213	9,128,546	9,382,110
Profit before tax	458,560	462,676	358,383	506,251	306,784
Income tax	137,294	134,780	104,738	166,283	91,079
Profit for the year	321,266	327,896	253,645	339,968	215,705
Earnings/share	110	112	87	110	134
X1	0.095179	0.080356	0.06384	0.0844785	0.100656
X2	0.040774	0	0	0	0
X3	0.0685256	0.057426	0.0393912	0.048423	0.0280484
X4	0.1533513	0.135923	0.128619	0.1452826	0.1658011
<b>EM Z</b>	<b>4.6288084</b>	<b>4.305757</b>	<b>4.0685496</b>	<b>4.2821283</b>	<b>4.2728793</b>
<b>Original Z</b>	<b>0.4894436</b>	<b>0.367487</b>	<b>0.2837705</b>	<b>0.3483397</b>	<b>0.3128274</b>

**Table 6 EM Z-Score of ZBL**

<b>Financial year</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Receivable	983,074	1,012,054	876,918	733,084	648,250
Investment	721,261	1,373,358	2,414,592	3,523,723	4,155,528
Cash	691,727	808,018	967,295	754,242	1,017,077
Fixed assets	87,276	130,062	185,198	182,307	162,424
Total assets	2,549,130	3,403,745	4,675,354	5,572,475	6,691,004
Current assets	2,461,854	3,273,682	4,493,047	5,390,168	6,528,580
Current liabilities	2,114,609	2,828,959	3,928,019	4,700,274	5,572,336
Retained earnings	260,353	379,598	459,584	206,240	388,014
Shareholders fund	434,520	574,786	747,335	872,201	1,118,668
Total income	376,748	361,087	425,243	621,560	570,305
Total expenses	261,666	158,495	174,706	288,462	268,773
Total liabilities	2,114,609	2,828,959	3,928,019	4,700,274	5,572,336
Profit before tax	115,080	202,590	250,534	281,843	352,787
Income tax	32,003	162,324	77,985	106,320	95,959
Profit for the year	83,077	140,265	172,549	246,467	185,884
Earnings/share			0.14	0.05	0.06
X1	0.136221	0.130657	0.1208525	0.1238039	0.1429149
X2	0.1021341	0.111524	0.0982993	0.0370105	0.0579904
X3	0.0451448	0.05952	0.0535861	0.0505777	0.0527256
X4	0.2054848	0.203179	0.1902575	0.1855639	0.2007539
<b>EM Z</b>	<b>4.9956989</b>	<b>5.083988</b>	<b>4.9231168</b>	<b>4.7175318</b>	<b>4.9416777</b>
<b>Original Z</b>	<b>0.5787216</b>	<b>0.631244</b>	<b>0.5736306</b>	<b>0.4786241</b>	<b>0.5471311</b>

#### 4.1.6 Zenith Bank Ghana Limited

Zenith Bank Ghana Limited was incorporated in April 2005 under the banking Act 2004 (Act 673) as a private limited company. From its current financial statement from the table above (table 6), there have been substantial increases in income and total assets in the year 2015 in comparison to 2019, both however remained high. In addition, there was a growth in assets and retained earnings from GHS 2,549,130 and GHS 260,353 in 2015 to GHS 6,691,004 and GHS 388,014 in 2019, therein order. Also, profit before interest paid increase from GHS 45,080 in 2015 to GHS 352,787 in 2019. As a result, the bank's emerging market Z'-score ratio index increase from 4.996 in 2015 to 5.083 in 2016 and from 4.718 to 4.942 in 2018 and 2019 correspondingly. But, this corporate

establishment continues to be within the safe zone, which is an indication that there is a low likelihood of collapse. All the same, this analysis provides an insight into the bank's performance. While the superior scores of 4.996 and 5.083 achieved by Zenith bank Ghana limited in 2015 and 2016 respectively, the emerging market Z-score tended sharply decline within the successive years, this demands urgent attention by management to discover the factors that are influencing the negative change in the ratios, these factors, if left unattended, might cause corporate failure.

#### **4.1.7 Standard Chartered Bank Ghana Limited**

Standard Chartered Bank Ghana limited is the oldest commercial bank in Ghana and has been quoted on the Ghana stock market since 1991. It started its operations in the year 1896 as the bank of British West Africa and served as the central bank of the Gold Coast in the pre-independence period until 1953. From its most recent annual report from the table below (table 7), there have been significant increases in total assets and a decrease in income from 2015 to 2019, there was an increase assets and a decline in income from GHS 3,369,448 and GHS 531,115 in 2015 to GHS 6,987,732 and GHS 192,378 in 2019, respectively. Moreover, profits before interest and tax increase from GHS 91,062 in 2015 to GHS 125,154 in 2019. As a result, the bank's Altman emerging market Z'-score indicator declined from 4.940 in 2015 to 4.714 in 2019, in that order. On the contrary, this bank continues to be within the healthy zone, which suggests that there is a low likelihood of insolvency. Nevertheless, this examination provides an insight into the bank's performance.

**Table 7 EM Z-Score of SCB**

<b>Financial year</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Receivable	1,219,459	1,262,636	1,385,696	1,291,082	1,401,216
Investment	583,231	1,278,874	1,256,940	1,868,178	2,070,221
Cash	725,360	1,454,542	1,692,694	1,912,493	2,187,524
Fixed assets	24,809	29,413	31,587	31,812	274,266
Total assets	3,369,448	4,373,564	4,776,984	4,408,897	6,987,732
Current assets	3,344,639	4,344,151	4,745,397	4,377,085	6,713,466
Current liabilities	2,814,348	3,608,348	3,856,228	4,403,498	5,853,026
Retained earnings	152,061	232,644	251,354	413,772	314,557
Shareholders fund	555,100	765,216	920,756	1,005,399	1,134,706
Total income	531,115	620,781	667,260	188,146	192,378
Total expenses	227,272	194,115	244,982	59,350	70,256
Total liabilities	2,814,348	3,608,348	3,856,228	4,403,498	5,853,026
Profit before tax	91,062	345,558	422,278	115,440	125,154
Income tax	4,553	19,531	117,566	28,860	31,288
Profit for the year	66,148	224,511	283,598	80,808	87,608
Earnings/share	0.55	1.92	2.44	0.59	0.64
X1	0.1573822	0.168239	0.1861361	-0.005991	0.1231358
X2	0.0451294	0.053193	0.0526177	0.0938493	0.0450156
X3	0.0451294	0.053193	0.0526177	0.0938493	0.0450156
X4	0.1972393	0.212068	0.2387712	0.2283183	0.1938666
<b>EM Z</b>	<b>4.9399191</b>	<b>5.107186</b>	<b>5.2468871</b>	<b>4.3870505</b>	<b>4.7105865</b>
<b>Original Z</b>	<b>0.5193101</b>	<b>0.579136</b>	<b>0.6139292</b>	<b>0.5708938</b>	<b>0.4756563</b>

#### **4.1.8 Access Bank Ghana Limited**

This bank launched its operations in the year 2009 as one of the most capitalized banks in Ghana. It has consolidated this reputation as one of the fastest-growing private banks in the sector. From its current financial statement from the table below (table 8), there is an increase in total income and total assets from 2015 through to 2019. Additionally, there was a rise in assets and a decline in retained earnings from GHS 2,424,439 and GHS 53,524 in 2015 to GHS 4,711,698 and GHS 6,588 in 2019, respectively. Furthermore, profits before interest and taxation enhance from GHS 122,716 in 2015 to GHS 220,085 in 2019. In effect, the bank's Altman emerging market Z'-score indicator



decreased from 4.564 in 2015 to 4.560 in 2019, in that order but still within the safe zone. Still, this bank remains in the healthy zone. This analysis, however, provides an insight into the bank's performance; the emerging market Z-score tended to decline within the subsequent years, this demands critical attention from the Executives to discover the issues causing this to stop insolvency.

**Table 8 EM Z-Score of ABG**

<b>Financial year</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Receivable	1,211,825	1,285,612	1,285,612	815,559	1,292,867
Investment	356,734	422,801	906,238	677,306	1,351,980
Cash	681,366	728,355	1,107,576	1,512,990	1,094,344
Fixed assets	93,117	110,356	121,419	126,150	227,426
Total assets	2,424,439	2,679,608	3,199,566	3,540,941	4,711,698
Current assets	2,331,322	2,569,252	3,078,147	3,414,791	4,484,272
Current liabilities	2,065,488	2,252,060	2,730,829	2,909,201	3,907,898
Retained earnings	53,524	13,105	43,298	-39,642	6,588
Shareholders fund	358,951	428,548	468,737	631,740	803,800
Total income	267,126	272,620	270,338	345,650	383,100
Total expenses	144,410	203,571	211,751	273,862	189,521
Total liabilities	2,065,488	2,252,060	2,730,829	3,414,791	4,484,272
Profit before tax	122,716	69,049	58,587	71,788	220,085
Income tax	42,306	27,115	28,995	21,942	46,381
Profit for the year	80,410	41,934	29,592	49,846	173,704
Earnings/share	73	38	25	28	100
X1	0.1096476	0.118373	0.1085516	0.1427841	0.1223283
X2	0.0220769	0.004891	0.0135325	-0.011195	0.0013982
X3	0.0506162	0.025768	0.0183109	0.0202737	0.0467103
X4	0.1737851	0.190292	0.1716464	0.1850011	0.1792487
<b>EM Z</b>	<b>4.5638745</b>	<b>4.415437</b>	<b>4.3094924</b>	<b>4.4806572</b>	<b>4.5591365</b>
<b>Original Z</b>	<b>0.4337894</b>	<b>0.348104</b>	<b>0.3126212</b>	<b>0.3335713</b>	<b>0.4104448</b>

#### 4.1.9 Societe Generale Ghana Limited

Societe Generale Ghana Limited is based in Ghana, previously known as Societe Generale-Social Security Bank (SG-SSB). It was founded in the year 1975 and its stock is traded on the Ghana Stock

Market. The bank is the 7<sup>th</sup> largest bank according to its website. From its current published annual report as depicted in the table below (table 9), there have been major increases in total assets and total income from 2015 through to 2019, there was a rise in total assets and retained earnings from GHS 1,992,231 and GHS 50,506 in 2015 to GHS 4,443,909 and GHS 66,162 in 2019, respectively. Also, profits before interest and tax rise from GHS 64,388 in 2015 to GHS 176,691 in 2019. Which cause an increase in the bank's Altman emerging market Z'-score index to improve from 4.296 in 2015 to 4.551 in 2019 correspondingly.

**Table 9 EM Z-Score of SG-GH**

<b>Financial year</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Receivable	900,962	942,308	1,409,551	1,665,284	2,643,394
Investment	75,664	540,724	235,926	694,224	91,966
Cash	850,155	775,207	757,751	641,836	1,295,640
Fixed assets	86,003	87,325	278,799	289,214	290,868
Total assets	1,992,231	2,448,836	2,789,742	3,431,356	4,443,909
Current assets	1,906,228	2,361,511	2,510,943	3,141,142	4,153,041
Current liabilities	1,728,251	2,116,281	2,270,889	2,729,571	3,641,947
Retained earnings	50,506	78,603	142,772	30,256	66,162
Shareholders fund	263,980	332,555	518,853	701,784	801,961
Total income	270,662	328,450	64,822	401,846	509,056
Total expenses	206,273	236,581	258,586	296,632	332,363
Total liabilities	1,728,251	2,116,281	2,270,889	2,729,571	3,641,947
Profit before tax	64,388	91,888	127,029	105,212	176,691
Income tax	19,782	27,988	36,522	43,239	48,149
Profit for the year	44,605	63,899	90,507	61,972	128,542
Earnings/share	0.12	0.17	0.21	0.11	0.18
X1	0.0893355	0.100141	0.0860488	0.1199441	0.11501
X2	0.0253515	0.032098	0.0511775	0.0088175	0.0148882
X3	0.0323195	0.037523	0.0455343	0.0306619	0.0397603
X4	0.152744	0.157141	0.2284801	0.2571041	0.2202012
<b>EM Z</b>	<b>4.2962554</b>	<b>4.428722</b>	<b>4.5272136</b>	<b>4.5415861</b>	<b>4.5514015</b>
<b>Original Z</b>	<b>0.3409956</b>	<b>0.383218</b>	<b>0.4622584</b>	<b>0.4117243</b>	<b>0.4221851</b>

**Table 10 EM Z-Score of BOA**

<b>Financial year</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Receivable	387,493	447,086	495,750	565,057	725,543
Investment	344,616	196,665	135,410	8,884	734,891
Cash	130,520	360,011	394,339	420,631	435,487
Fixed assets	8,839	47,116	55,333	53,756	58,917
Total assets	1,146,997	1,144,481	1,343,055	1,258,376	2,047,775
Current assets	1,138,158	1,097,365	1,287,722	1,204,620	1,988,858
Current liabilities	1,008,416	980,541	1,154,847	1,050,218	1,452,108
Retained earnings	-29,746	-28,924	-22,288	-15,827	13,858
Shareholders fund	138,580	163,940	188,188	208,157	595,666
Total income	131,271	112,365	122,102	145,450	217,088
Total expenses	62,175	87,249	88,754	108,073	127,387
Total liabilities	1,008,416	980,541	1,154,847	1,050,218	1,452,108
Profit before tax	39,541	25,115	33,345	37,345	89,701
Income tax	10,044	948	9,426	1,868	4,485
Profit for the year	27,519	24,167	23,919	24,573	64,696
Earnings/share	0.276	0.24	0.242		
X1	0.1131145	0.102076	0.0989349	0.1226994	0.2621138
X2	-0.025934	-0.02527	-0.016595	-0.012577	0.0067673
X3	0.0344735	0.021944	0.0248277	0.0296771	0.0438041
X4	0.1374234	0.167193	0.1629549	0.1982036	0.4102078
<b>EM Z</b>	<b>4.2834435</b>	<b>4.160249</b>	<b>4.1828582</b>	<b>4.4214503</b>	<b>5.7166097</b>
<b>Original Z</b>	<b>0.2956467</b>	<b>0.259842</b>	<b>0.2751933</b>	<b>0.3464878</b>	<b>0.7146891</b>

#### 4.1.10 Bank of Africa Ghana Limited

Bank of Africa Ghana commenced its operations in Ghana in the year 2011 after gaining majority interest in Amalgamated Bank. Its major shareholder is Bank Marocaine du Commerce Extérieur. From its current annual report from the table above (table 10), there is an increase in total income and total assets from 2015 through to 2019. Additionally, there was a rise in assets and retained earnings from GHS 1,146,997 and GHS (29,746) in 2015 to GHS 2,047,775 and GHS 13,858 in 2019, correspondingly. Besides, profits before interest and taxation enhance from GHS 39,841 in 2015 to GHS 89,701 in 2019. In effect, the bank's EM Z'-score index improve from 4.283 in 2015 to



5.717 in 2019, respectively. This analysis on the other hand provides an insight into the bank's performance.

**Table 11 EM Z-Score of FNB**

<b>Financial year</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Receivable	1,365	3,289	28,518	84,633	105,670
Investment	95,870	155,437	76,523	244,738	491,036
Cash	33,311	79,663	77,525	225,205	286,420
Fixed assets	10,261	21,267	22,545	20,381	38,991
Total assets	147,570	283,909	260,294	640,620	986,289
Current assets	137,309	262,642	237,749	620,239	947,298
Current liabilities	15,336	146,049	123,310	210,632	553,608
Retained earnings	-4,524	-12,682	-39,594	-79,051	-74,515
Shareholders fund	132,234	135,860	136,984	429,988	432,681
Total income	21,924	31,554	33,119	48,586	91,565
Total expenses	26,602	39,674	60,533	85,477	88,047
Total liabilities	15,336	146,049	123,310	210,632	553,608
Profit before tax	-4,678	-8,146	-27,414	-36,891	3,518
Income tax	114	12	782	2584	-559
Profit for the year	-4,792	-8,158	-26,632	-34,307	2,693
Earnings/share					
X1	0.8265433	0.41067	0.4396529	0.6393915	0.3991629
X2	-0.030657	-0.04467	0.1521126	-0.123398	-0.075551
X3	-0.0317	-0.02869	0.1053194	-0.057586	0.0035669
X4	0	0.930236	1.1108912	2.0414182	0.7815657
<b>EM Z</b>	<b>8.3591582</b>	<b>6.582311</b>	<b>6.0969253</b>	<b>8.7986406</b>	<b>6.4668265</b>
<b>Original Z</b>	<b>0.844322</b>	<b>0.893724</b>	<b>0.6336066</b>	<b>1.6293289</b>	<b>0.8539345</b>

#### **4.1.11 First National Bank Ghana Limited**

First National Bank Ghana Limited was licensed by the National Banking Regulator and the Bank of Ghana in the year 2015, five years ago. In May 2020 the Bank of Ghana approved a merger between Ghana Home Loans and FNB Ghana which was accepted by the Reserve Bank of South Africa which now owns 100% shares of Ghana Home Loans. From its current annual report from the table above (table 11), there is an increase in total income and total assets from 2015 through to 2019.



Additional, there was a rise in total assets and negative retained earnings from GHS 147,570 and GHS (4,524) in 2015 to GHS 986,289 and GHS (74,515) in 2019, correspondingly. Besides, profits before interest and taxation enhance from GHS (4,678) in 2015 to GHS 3,518 in 2019. In effect, the bank's EM Z'-score index declined from 8.359 in 2015 to 6.582, 6.097, 6.467 in 2016, 2017, and 2019 respectively, and increase to 8.799 in 2018 which is an improvement of the preceding years. This analysis on the other hand provides an insight into the bank's performance.

**Table 12 EM Z-Score of ABSA**

<b>Financial year</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Receivable	1,663,080	2,093,662	2,593,012	2,970,787	4,082,295
Investment	1,071,962	1,056,426	1,747,994	2,321,712	2,550,401
Cash	478,106	965,965	1,011,756	1,336,090	1,532,655
Fixed assets	53,405	59,663	57,874	51,349	105,174
Total assets	3,611,110	5,288,817	5,954,035	8,994,562	11,772,546
Current assets	3,557,705	5,229,154	5,896,161	8,943,213	11,667,372
Current liabilities	3,027,660	4,496,741	4,901,546	7,657,089	10,139,424
Retained earnings	198,932	328,397	507,356	491,108	683,756
Shareholders fund	583,450	792,076	1,052,489	1,337,473	1,633,122
Total income	593,896	714,983	887,297	952,446	1,164,078
Total expenses	336,216	291,793	337,041	408,933	488,060
Total liabilities	3,027,660	4,496,741	4,901,546	7,657,089	10,139,424
Profit before tax	244,796	432,190	550,256	554,447	676,018
Income tax	67,780	118,655	164,083	165,104	201,395
Profit for the year	177,016	304,535	386,173	389,343	468,623
Earnings/share		4.95	6.28	4.33	5.21
X1	0.1467817	0.138483	0.1670489	0.1429891	0.1297891
X2	0.0550889	0.062093	0.0852121	0.0546005	0.0580806
X3	0.0677897	0.081718	0.0924173	0.0616425	0.0574233
X4	0.1927066	0.176144	0.2147259	0.1746712	0.1610665
<b>EM Z</b>	<b>5.0510444</b>	<b>5.095785</b>	<b>5.4710632</b>	<b>4.9642646</b>	<b>4.8463375</b>
<b>Original Z</b>	<b>0.5925924</b>	<b>0.628465</b>	<b>0.7535684</b>	<b>0.5562505</b>	<b>0.5231964</b>

#### **4.1.12 ABSA Bank Ghana Limited**

ABSA Bank Ghana limited, previously recognized as Barclays Bank of Ghana, is a commercial bank in Ghana and quoted on the. The bank commenced its operations in Ghana in the year 2020 after it was launch by the Governor of the Bank of Ghana, Dr. Ernest Addison on February 10, 2020. From its annual report from the table above (table 12), total income and total assets have increased from 2015 through to 2019. Additional, there was a rise in assets and retained earnings from GHS 3,611,110 and GHS 198,932 in 2015 to GHS 11,772,546 and GHS 683,756 in 2019, correspondingly. Besides, profits before interest and taxation enhance from GHS 177,016 in 2015 and increasing through to GHS 468,623 in 2019. In effect, the bank's EM Z'-score index improve from 5.051 in 2015 to 5.096, 5.471 in 2016 and 2017 respectively, and then decline marginally to 4.964 in 2018 and 4.846 in 2019, correspondingly. Still, this bank remains in a healthy region. This analysis, however, provides an insight into the bank's performance; the emerging market Z-score tended to decline from 2018 to 2019, this demands urgent attention from management to discover the factors causing this to improve on the ratios that are dragging the emerging market Z-score downward.

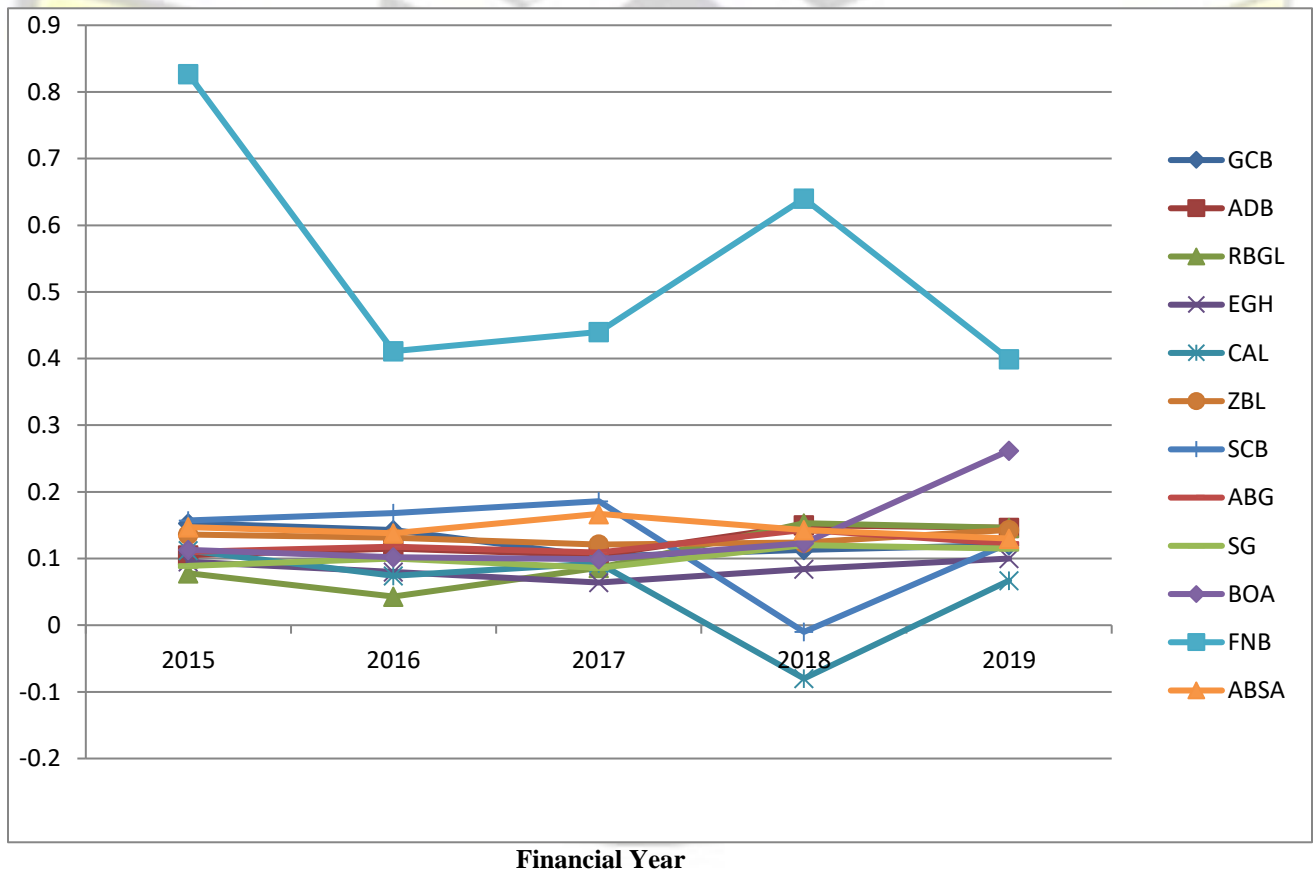
#### **4.3.1 The Ratio of Working Capital to Total Assets**

To establish the direction of the relationship that exists between working capital to total assets ratio and corporate failure, the research deems it essential to draw a line of best fit that is the key determinant of the predictive accuracy of the Z- score model by Altman (Anderson et al., 2002), the result is shown in figure 2 above. Ratio X1, which concerns working capital, which determines the correlation that exists between current liabilities and current assets, where current assets are expected to exceed current liabilities more than twice in this sector. Generally, current assets are established to be low in contrast to total assets, when a business is under constant operational failure. This ratio is

established as the most important ratio among the three evaluated ratios for the reason that the current ratio and quick ratio are noticed to be less useful (Altman, 1968). As shown in figure 2 EGH, SG, RBGL should enhance its short term stability situation as it is less than the sector average, whereas GCB, ADB, FNB, ZBL, ABSA, BOA, and ABG appear above the sector average, its stakeholders have got to closely monitor the decrease in ratio X1, as it acts as a warning sign and takes the necessary actions to prevent further deterioration. CAL recorded a negative X1 ratio in 2016, 2017, 2018, and 2019 whereas SCB recorded a negative current ratio in 2018. In conclusion, those banks are therefore advised to improve their investments in working capital.

**Figure 2 : Banks X1 Ratio Score**

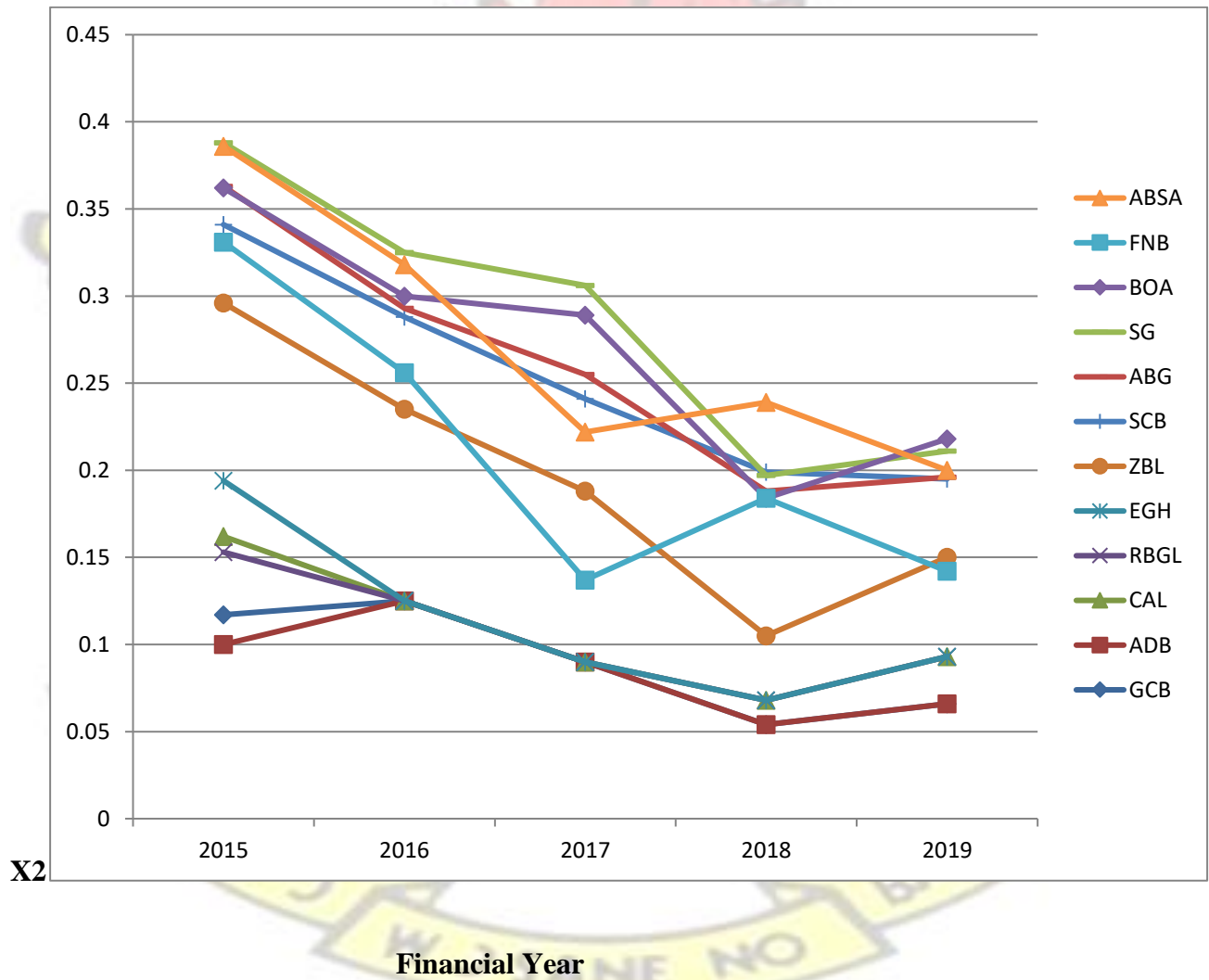
**X1**



### 4.3.2 The ratio of Retained Earnings to Total Assets

The ratios X2(retained earnings to total assets) and X3(profit before taxation and interest and total assets) determine operating efficiency that interprets as the ability of banks in Ghana to make enough profits from sales of products and services and more so their efficiency in producing sales using assets. Hence enhancing the ratios of retained earnings and return on total assets will result in improvement of the overall emerging market Z-score.

**Figure 3 : Banks X2 Ratio Score**





**Figure 4 : Banks X3 Ratio Score**

**X3**

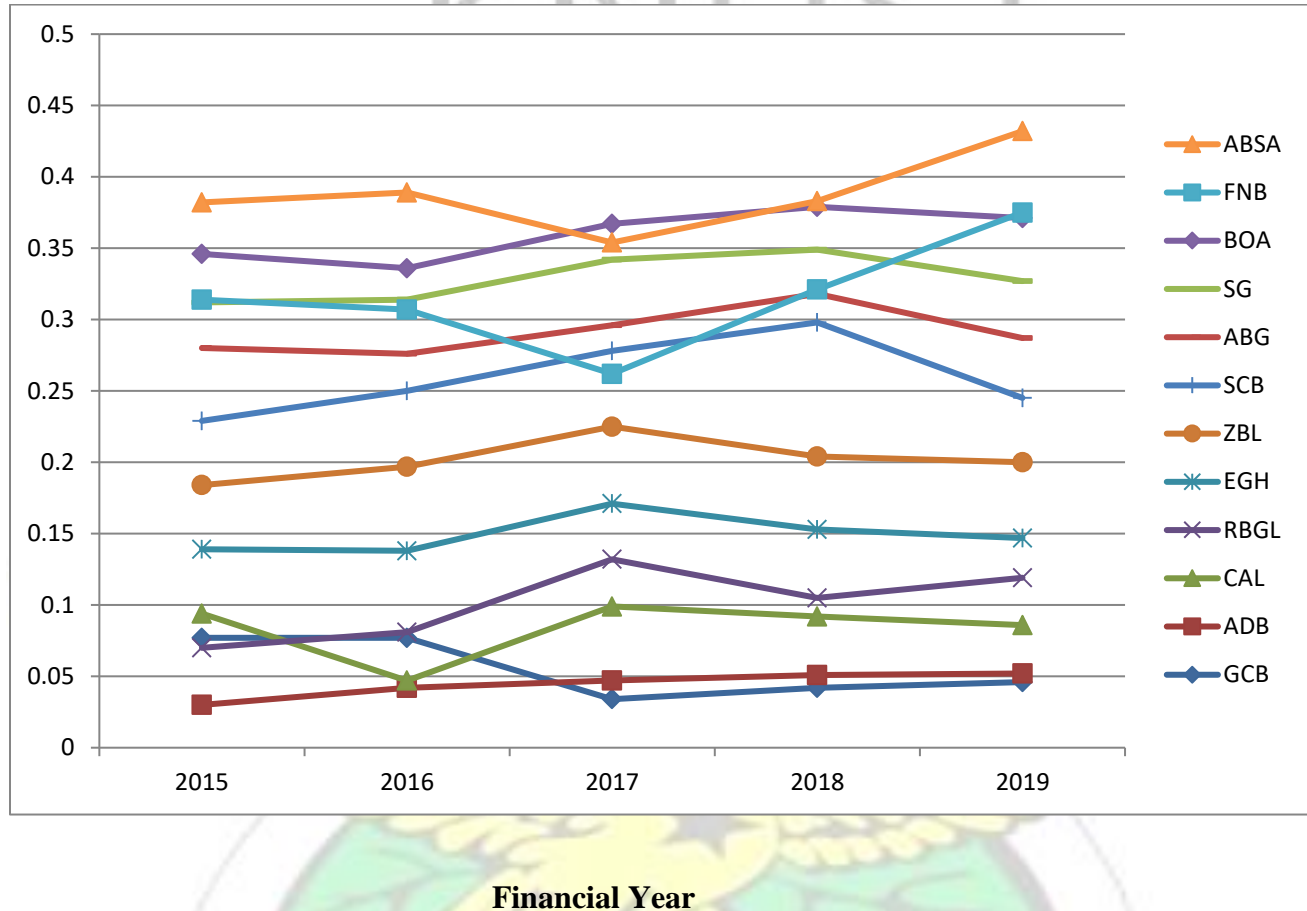
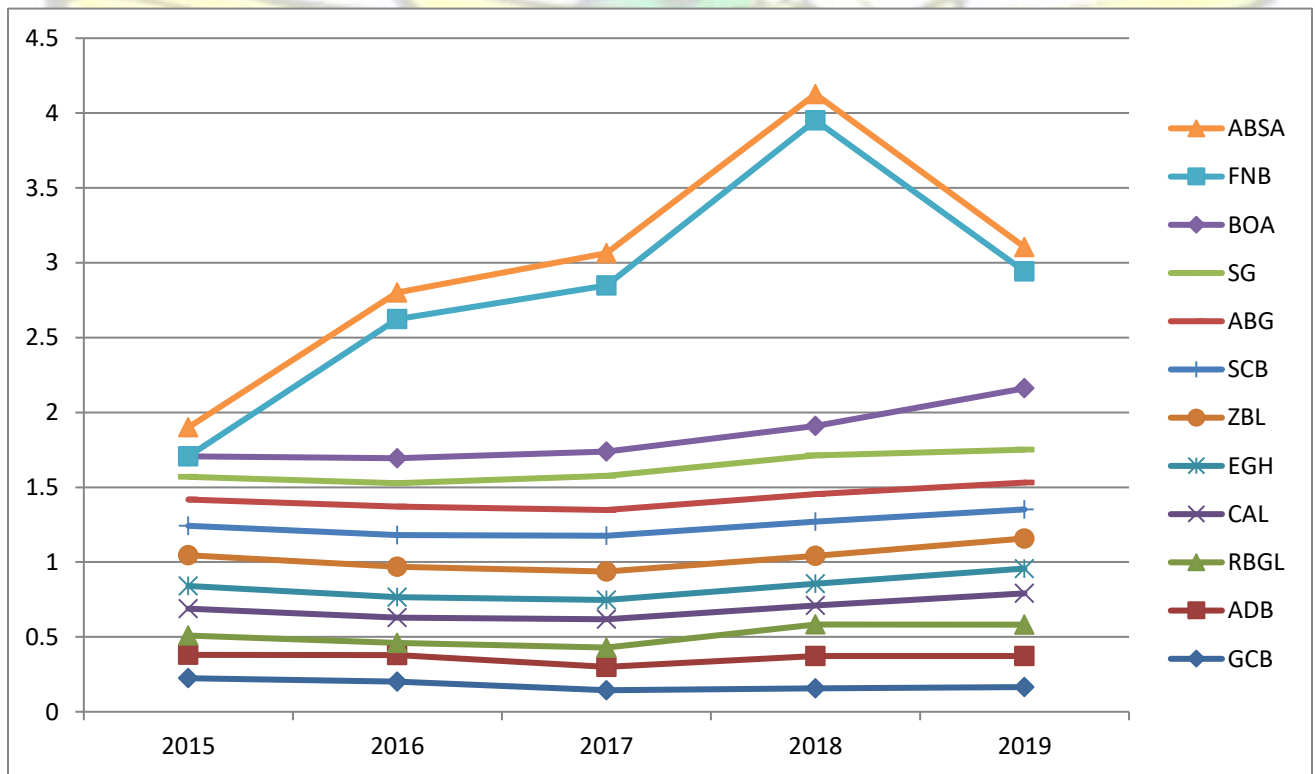


Figure 4 shows that all the 12 banks have improved their condition since 2018, the only exception being GCB, whose X3 ratio decline sharply in the subsequent years. This condition demands urgent attention by management to discover the factors causing the decrease to prevent corporate failure. FNB, ABSA, BOA, enhance considerably after 2017, continued marginally through to 2019 after seeing a decline in 2016. This enhancement is mainly attributable to the proceeds from investment securities. The SG, CAL, ABG, and ZBL improved their position from 2015 up to 2018 and start to decline from 2018; this was due to unbalanced growth in the profitability and assets. Figure 3 shows that all the Banks saw a downward turn concerning retained earnings from 2015 up to 2018 which

saw a steady improvement except for FNB and ABSA. FNB recorded a major turn down from 2018 to 2019. With fresh capital addition, shareholders will anticipate a superior return on their investments. FNB, RBGL, and CAL could not retain any profit, the reason being that management of those banks allocated more dividend to stakeholders and also more participant dividend was paid to deposit certificate holders whilst relying on initial public offer to enhance its paid-up capital during 2016, the exception being GCB and ADB which improve their retained earnings (ratio X2) to improve and expand their business operations. Altman (2000), explains that businesses with low total assets in comparison to retained profit are noted not utilized much debt and therefore rely on retained earnings in financing the operational assets.

**Figure 5: Banks X4 Ratio Score**

**X4**



**Financial Year**

### **4.3.3 Market value of equity to total liability ratio**

The ratio X4 determines long-term financial stability that is it measures the correlation that exists between equity funds and total liabilities. The extreme gearing which results as of trade on equity can cause the corporate organization to become bankrupt and could lead to bankruptcy as the capital cushion may not be adequate to offset the organization's contingent obligation. Figure 5 demonstrates the performance of banks in Ghana. GCB and ADB should research into the reasons that are causing a slight increase in liabilities and deterioration in their net worth because deteriorating tendency might lead to weakness which can cause serious problems. For the time being ABSA, FNB, BOA, SG, ABG, SCB, ZBL, EGH, CAL, RBGL performance are improving meaning an increase in net worth or decrease in total liabilities. This ratio establishes how business assets may decline in value, the situation where assets are lower than liabilities, the business is declared bankrupt. For instance, a business that has a market value of debt of GHS 50,000 may experience decrease assets by two-third in the value before liquidation. Altman (2000) explains that a market value that is not considered in the bankruptcy examination is incorporated in the ratio.

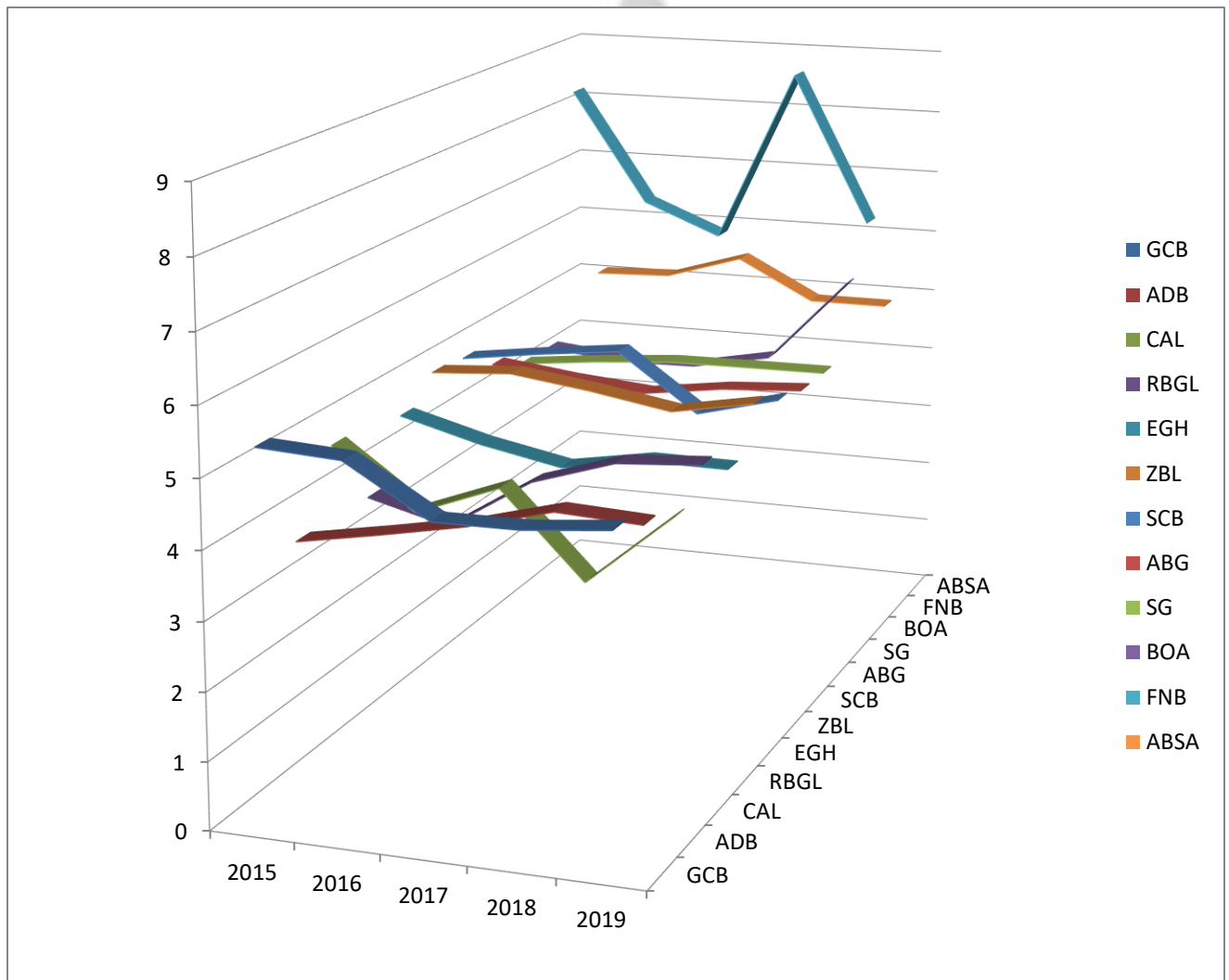
### **4.4 Emerging Market Z-score for the 12 Banks in Ghana**

Figure 6 below provides insight into the performance of banks in Ghana, despite the higher emerging market Z-scores attained by ADB and RBGL in 2017 of 4.197, 4.17, 2018 of 4.527, 4.563 and 2019 of 4.467, 4.653, correspondingly, it was an improvement from their 2015 of 3.735, 3.709 and 2016 of 3.957, 3.395, respectively which shows a slight decline, reflecting an enhancement on their financial performance and financial position. CAL on the other hand recorded higher EM scores in 2015, 2017, and 2019 and a lower score in 2016 and 2018. These conditions demand urgent attention by management so that the factors causing the decline in the emerging market ratios could be discovered, these factors if left might cause bankruptcy and failure. The following banks recorded

the highest performance concerning emerging market Z-score: GCB, FNB, ABSA, ZBL, BOA, ABG, SCB, and SG, signifying an enhancement in their financial performance and financial position and therefore the likelihood of failure is exceptionally low.

**Figure 6: Emerging Market Z-score of 12 Banks in Ghana**

**EM-Z-score**



**Financial Year**



#### 4.5 Chapter Summary

The objectives of this research are how to put into operation the emerging market Z-score model in predicting corporate failure and to evaluate financial performance through the analysis of the annual audited report of 12 banks in Ghana. The research extensively establishes that quoted banks in Ghana are financially sound and hale and hearty, although the emerging market Z-score of the 12 banks in Ghana is in the financially healthy zone by exceeding the cut-off threshold of 2.60, the emerging market Z-scores of two major banks that are GCB and EGH continuous to decline. The research establishes that emerging market Z-score is a helpful diagnostics tool that can be utilized by banks in Ghana to complement other analysis methods used in the banking industry in establishing corporate failure. The research establishes that the financial ratios utilized in determining emerging market Z-score provide a valuable influential indication of corporate failure. Emerging market Z-score should be adopted by banks in Ghana to surmount the credit risk which is related to participant profit models and the development of credit management methods based on the Z-score model and supporting them with other methods. The results imply however that, foreign banks are more profitable and efficient than local banks which is consistent with the studies by Berger et al (2010) and Bonin et al (2003). This is probably because foreign banks are well diversified and possess better technology than local banks (Berger et al 2000). It is also in tandem with the result documented by Obaid Saif H., Al Zaabi (2011) of four banks of UAE utilizing the emerging market Z-score. This is however not in line with the study conducted by Kingsley Opoku Appiah (2011), which examined 15 corporate organizations in Ghana using the Altman Z-score model due to type ii error.

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## CHAPTER FIVE

### SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

#### 5.0 Introduction

The objectives of this research are how to put into operation the emerging market Z-score model in predicting corporate failure and to evaluate financial performance through the analysis of the annual audited report of 12 banks in Ghana. The research is purposely to establish how the following independent variables (earnings before interest and taxation to total assets ratio, working capital to total assets ratio, retained earnings to total assets ratio, and market value of equity to total liabilities) impact corporate failure of banks in Ghana. The chapter sun up the research findings, recommendations, conclusion, and areas for further research. Besides, the conclusion that was drawn by the research was based on research objectives.

## 5.1 Summary of Research Findings

The objective of this research was to verify the validity of the Altman emerging market Z-score as a predictor of business failure on banks in Ghana. Purposefully, the research assessed the impact retained earnings to total assets, establish the influence of working capital to total assets ratio, determine the impact of the book value of equity to total liabilities ratio and establish the impact of earnings before interest and taxation ratio in the prediction of corporate failure of banks in Ghana. Summing up, offered in line with the study objectives. Corporate bankruptcy utilizing the emerging market model by Altman, the outcome indicates that the gearing ratio which is measured by the market value of equity to total liabilities ratio was the highest predictor of business failure of banks in Ghana. The profitability ratio follows which is measured using profit before taxation and interest to total assets. The third was the working capital to total assets ratio whilst the ratio of retained profit to total assets was establish as the least predictor of corporate failure of banks in Ghana. The primary aim of this research was to establish the precision of the emerging market Z-score model by Altman in the prediction of corporate bankruptcy utilizing a dataset between the periods of 2015-2019 of 12 banks of the banking sector in Ghana. The outcome revealed the application of the emerging market Z-score model developed by Altman is persuasive in exposing the possibility of bankruptcy of banks in Ghana.

The research establishes that banks in Ghana should work hard on enhancing the Z-score ratios which are dragging the emerging market Z-score down to better comprehend the earlier period performance and to realize their current situation in the sector; the Z-score can be adopted by banks in Ghana as an effective and efficient assessment approach towards the financing the possible long joint venture projects encompassing Small and Medium businesses enterprises. This model was adopted by banks in Ghana as an autonomous credit hazard examination approach to appraising the



financial strength and competencies of potential projects. Banks in Ghana are financially healthy and sound which means that the Z-score model is a beneficial analytical tool that can be adopted by banks in Ghana to supplement other financial analysis methods to determine bank averages in Ghana. In addition, the outcome demonstrated that despite the worth the emerging market Z-score model developed by Altman indexing reveal the financial statement conditions of the company; the emerging market Z-score developed by Altman four(4) variables have a substantial influence on revealing business as collapse or on the verge of failure. In the end, and in accordance with, the outcome depicted above, the emerging market Z-score model developed by Altman (2002) is considered extremely precise, reliable, and accurate model and therefore can be utilized in the prediction of bankruptcy of corporate establishment in Ghana, Africa and the world at large. The research also establishes that the accounting ratios utilized in computing the emerging market Z-score are determined to provide a helpful influential indicator.

### **5.3 Conclusion**

To conclude, it is significant to mention that bankruptcy is a widespread observable fact which might be experienced by large, small, and medium organizations within diverse economy frameworks, both developing and developed. Hence, a Nation's financial system and social wellbeing might experience substantial destruction which could result in massive cost as the result of the corporate failure of businesses and financial institutions. For this matter, corporate failure prediction is a significant subject matter which has gained the attention of many studies (Kingsley Opoku Appiah, 2011), professionals, and academics who are interested in corporate failure prediction. At hand, numerous outcomes account for this, both indirect and direct and, which might show the way to business failure. The main objective of the study is to examine the performance of Banks in Ghana by applying the emerging market Z-score model by Altman and also to establish the reliability and



accuracy of the emerging market Z-score model in the prediction of corporate failure in Ghana by the application of data from 12 banks. The outcome depicts that the application of the emerging market Z-score model was persuasive in reporting failure. The inefficiencies and weaknesses that reflect the company's directors and management and also under their control are known direct whereas those issues that are outside or external to the organization and therefore not under the control of the company directors and management are the indirect reasons which are a reflection of the external environment. The research importantly shows that banks in Ghana are by and far financially healthy and sound, all the emerging market Z-score ratio of the 12 banks are in the healthy zone by importantly over and above the threshold of 2.60. Eventually, according to the outcome, it can be said that the emerging market Z-score by Altman can be considered a highly reliable and accurate model and hence can be used for predicting corporate failure in Ghana, Africa, and the World at large. In summation, to comprehend better their earlier period performance and realized the current situation in the banking sector, banks in Ghana ought to work towards enhancing financial ratios which are dragging the emerging market Z-score downwards

## **5.4 Recommendations**

### **5.4.1 The Ratio of Working capital to total assets and corporate failure**

The working capital ratio to total assets positively impacts the predictor of corporate failure of banks which are in Ghana. This suggests that the working capital to total assets ratio increases the emerging market Z-score ratio value leading to low corporate failure likelihood. Management ought to look into strategies of reducing their debt burden by borrowing prudently. The study recommends to the management of listed banks to develop a working capital management policy that is likely to make sure that current liabilities are maintained at a lower level than current assets and this should

be benchmarked with other industry players. More so, the study recommends that the Bank of Ghana, the regulatory body charged with monitoring and evaluation should ensure stability in the banking industry in Ghana, and develop the ratio of working capital to total assets model and the application of the Altman Z-score model which was developed purposefully for an emerging market to warn against financial difficulties of banks in Ghana, Africa, and the world at large for early corrective actions.

#### **5.4.2 The Ratio of Retained earnings to total assets and corporate failure**

The retained earnings ratio to total assets has a negative influence on predicting corporate failure but statistically important. The result revealed that it influenced negatively on the emerging market Z-score value and hence increased corporate failure. The study, therefore, recommends improving the use of retained earnings policy strategies that are geared towards improving retained earnings in banks in Ghana. This can be achieved by effectively using total assets and reducing cost and other operating expenses and hence have increased in retained earnings that are usually added to the market value of equity, this will move up the emerging market Z-score ratio and reduce corporate failure probability. The study also recommends the management of listed banks to apply resource dependency and the pecking order theory that emphasizes careful borrowing and proper resource management.

#### **5.4.3 The Ratio of profit before interest and taxation to total assets and corporate failure**

This research established that the ratio of profit before taxation and interest to total assets was positive in predicting corporate failure and statistical importance to banks in Ghana. This research recommends earnings before interest and taxation should be used properly to test improved operations efficiency of banks in Ghana. This research also recommends enhanced control of

financial performance by reducing operating expenses and cost to check the corporate failure likelihood of their respective banks. Finally, the research recommends that the management of banks in Ghana should benchmark with other banks in the world to enhance operational efficiency.

#### **5.4.4 The Ratio of the Market value of equity to total liabilities and corporate failure**

This study revealed that the ratio of the market value of equity to total liabilities has a positive influence in predicting the business failure of banks in Ghana. This research recommends careful borrowing and management of liabilities in listed banks and for that matter the banking sector to reduce failure likelihood. Finally, the study recommends appropriate management of resources and healthier investments of funds to generate enough returns that are probable to increase the reserves of those banks and hence increase the emerging market Z-score, thereby reducing corporate bankruptcy.

#### **5.4.5 The emerging Market Z-score Ratios Model and Corporate Failure**

This research recommends that the Altman emerging market Z-score ratio model of financial accounting ratios should be adopted as a forecaster of corporate failure. The study also recommends the use of the Altman emerging market Z-score ratio model when interpreting and analyzing the financial statements of the corporate establishment by various stakeholders of banks in Ghana. To finish the research recommends the use of the Altman emerging market Z-score ratio model as a diagnostic of the sustainability of the performance of banks in Ghana to improve economic and development agenda and also to increase Gross Domestic Product.



## 5.6 Implication for the Study

It was ascertained from this research that the Altman emerging market Z-score ratio model is an applicable model for measuring the performance of quoted banks in Ghana and the accounting ratios utilized in computing the emerging market Z-score is well thought-out to provide precious influential indicators. The Z-score ratio can be adopted by banks in Ghana to funding long term joint venture projects and medium and small enterprises. Limitation including the Ghanaian banking sector is still considered to be a small size that may have negative consequences on the maximum result of the research. Future research should be conducted towards updating coefficient value associated with every ratio in the Altman emerging market Z-score ratio model as per the inputs from the banks in Ghana.

It was established through this study that the emerging market Z-score developed by Altman is a robust model for predicting corporate failure of corporate organizations both in developing and developed countries, thereby contributing to the existing literature about the Z-score ratios model. Therefore this research expanded the discourse of the applicability of the model as in the case of Kingsley Opoku Appiah (2011), which establish that the Altman Z-score cannot be applied in Ghana because of type I and type ii errors . Key ratios of the model include the market value of equity to total liabilities, earnings before interest and taxation to total assets, working capital to total assets, and retained earnings to total assets ratios which cover every aspect of the financial performance of the business organization including shareholders value, efficiency, profitability, and liquidity. For this reason, this research contributes to the existing studies in the zone of corporate failure that business organizations face by explaining further the already existing theories, empirical studies, and models on the corporate failure of banks quoted on the Ghana Stock market and recommendations to stakeholders and policymakers. The study reviewed the model which can be



utilized to predict business failure, thereby contributing to the existing body of knowledge in the corporate failure of banks in Ghana by the application of discriminating analysis. In the real world, the findings of this research have implications for potential employees and employees in the sense that they may be able in union with management to adopt strategies that will enhance the financial performance of the business organization and potential employees seeking employment in a stable establishment.

### **5.7 Areas for further studies**

This research was anchored on the emerging market Z-score model. Future studies may explore the application of other equally important models like Zmijewski's and Springate's models to predict the corporate failure of banks quoted on the Ghana Stock market to confirm if the same outcome may be obtained. This research paid attention only to banks in Ghana, other researchers may expand this analysis to take account of other sectors such as manufacturing, airlines, construction, and hotel industry that pertinent for economic growth and sustainable employment.

On the other hand, further studies may be carried out on listed banks utilizing non-financial factors such as staff motivation, boardroom wrangles, and business association with other stakeholders to determine if the same outcome may be obtained, this is because non-financial factors also affect financial factors. The result of this research implies suppliers and customers in view with the fact that its supply's information that may make possible for them to assess the corporate failure of banks in Ghana for the constant provision of services and customer tailed product to satisfy the ultimate aim of the corporate establishment.

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## 7.0 APPENDIX

### Appendix – Definitions and Abbreviations Used in the Study

#### 1. The following words are used interchangeably in this Study:

- i. Bankrupt, failed, liquidated, insolvency and collapse.
- ii. Business, organization, entity, company, and firm
- iii. Healthy, non-failed and non-bankrupt

#### 2. Definition of Bankruptcy

It refers to an organization that exhibits a condition where a company is no longer feasible as a going concern in such a case; the business is no longer able to meet its financial obligation (Bhurnia & Sarkar, 2011)

#### 3. Definition of Altman's Z score

The Z score is a criterion variable that is generally applied in the study of corporate failure and bankruptcy likelihood (Bhunia & Sarkar; Burksaitiene & Mazintiene, 2011).

#### **4. Definition of Total Asset**

Total assets can either be touchable such as property, plant, and equipment or intangible such as intellectual property, patents, or copyrights (Babalola, 2013).

#### **5. Definition of Book Value of equity**

Refers to the rights or the shareholder's investment in the business (Cornett et al., 2012), Book value of equity is recognized in the statement of financial position and is normally measured by the difference between total assets and total liabilities of a company and the higher the total assets the better the company since the low bankruptcy likelihood the company will be.

#### **7. Definition of Discriminant analysis**

Refers to a quantitative model that uses data to forecast the result based on alliance (Burksaitiene & Mazintiene, 2011). In the prediction of bankruptcy, the linear model of discriminant analysis uses the same concept. This model incorporates precise financial distinctiveness and ratios to ascertain the possibility of bankruptcy (Burksaitiene & Mazintiene, 2011).

#### **8. Definition of Earnings before interest and tax**

It represents the percentage of total sales left after deducting all normal operating expenses (Cornett et al., 2012). High and increasing earnings before interest and tax are an indication that management is effective in controlling operating costs (Palenu & Healy, 2008 )

#### **9. Definition of Equity**



It represents the net assets. It is the difference between the total assets (non-current plus current assets) less total liabilities (non-current liabilities plus current liabilities). The higher the value of equity in the company's statement of financial position the low the bankruptcy likelihood

#### **10. Definition of Financial statements**

Refers to, accounting records which offer information to the users about the performance of the business changes in performance and the position of the business as at a given date. Financial statements are prepared as if a business will carry on with business and not go into bankruptcy.

#### **11 Definition of Working capital**

This refers to the difference between current assets and current liabilities (Burnia & Sarkar, 2011). The study used this ratio to classify banks quoted on the Ghana Stock Exchange. This is because this ratio is the only one that ascertains the liquidity position of the company in Altman's Z score ratios model.

#### **12, Definition of Retained earnings**

Refers to the percentages of net income not paid out as dividends they are reinvested in the business or utilize to pay debts of the firm (Chasan, 2012).

#### **13. Definition of Ratio**

Is an expression of the association between two or more variables. Once the relationship is ascertained, it forms a model which will be used for future planning and decision-making processes.