Bankruptcy and Financial Distress Prediction in the Mobile Telecom Industry

The case of MTN-Ghana, Millicom-Ghana and Ghana Telecom

*Author:* Bright Kpodoh

*Supervisor:* Prof Anders Hederstierna
Abstract

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Author: Bright Kpodoh

Supervisor: Anders Hederstierna

Department: School of Management, Blekinge Institute of Technology

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Background and Problem Discussion: Signs of eminent business failure are usually evident long before official bankruptcy of any form, be it re-organization or liquidation. A number of methods have been developed over the years to assess the financial health of corporations, either using financial ratios directly or using bankruptcy prediction models based on grounded financial theories and ratios.

Purpose: The purpose of this thesis is to test Altman’s Z-score prediction model using sample data from the mobile telecommunication industry in Ghana.

Method: Quantitative and qualitative approach based on ‘modified single case’ design. Primary data was collected using questionnaire survey methods, whiles secondary data were mainly sourced from company annual financial reports, industry regulators and industry analysts’ reports.

Theory: The theory section reviewed past bankruptcy literature and compared their strengths, weaknesses and use in research. Marketing strategies for emerging markets at the base of the economic pyramid was also discussed alongside the relationship between corporate governance and corporate failure.

Analysis: The data was analysed using descriptive statistics, z-score analysis, financial ratio analysis and trending. Key solvency ratios were compared with industry averages. The z-scores were compared with z-scores of other companies that went bankrupt in the past. Corporate governance scores were compared to scores suggested by other researchers as strong indicators of good corporate governance.

Conclusion: The research findings confirmed the strength and ability of the z-score model in predicting eminent business failure as it predicted accurately the distress positions of the case companies. It also confirmed the correlation between corporate governance and corporate failure. Finally, companies operating in BOP markets ought to adopt and adapt the myriads of marketing strategies available, especially for mobile telecommunication operators, in order to be able to compete effectively and earn positive average margin per user (AMPU) in the midst of declining average revenue per user (ARPU) in the region.
Acknowledgements

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I am also very grateful to all respondents to my questionnaire as well as agencies that provided secondary data to support this research to its conclusion. Finally, my heartfelt gratitude goes to my dear wife Mrs Abigail Kpodoh for her encouragement and moral support during my two year studies and research work. This thesis is dedicated to my son Selikem Giancarlo Kpodoh.

Bright Kpodoh

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Chapter One

1.0 Introduction

The increasing number of large and complex bankruptcy cases and the fact that 40% of firms continue to post losses three years after coming out of bankruptcy (Altman, E. I, and Hotchkiss, E., 2005), provides ample need for further research into the bankruptcy studies so as to validate or refute existing established models. Bankruptcy involves so much wealth and usually deals with the critical issues of corporations’ survival and death, and therefore worth continuously researching into. Many of the bankruptcy prediction models are purely empirical, grounded on accounting and financial theories, ignoring such issues as corporate governance and marketing activities, in most cases. This thesis will explore the use of the bankruptcy models in the telecommunication industry, with specific reference to mobile telecommunication in Ghana. The research will be a blend of finance, corporate governance and marketing strategies as they pertain to emerging markets, especially those at the so called bottom of the economic pyramid (BOP).

1.1 Purpose and Research Questions

This research is aimed at testing the methodologies use in signalling or predicting financial distress, corporate default and/or bankruptcy. The primary objective is to use data from the mobile telecommunication industry in Ghana to test the widely used model - Multivariate Discriminant Analysis (MDA), specifically the Z-score model. The model would be tested against the three major mobile telecommunication companies in Ghana; Mobile Telecommunications Network Ltd (MTN), Millicom Ghana Limited (Tigo) and Ghana Telecommunication Company Limited. The Z-scores of the three companies would

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1 Vodafone Group has since acquired 70% majority shares in Ghana Telecommunication Company Limited in August 2008

be computed from a number of financial ratios derived from financial reports and then compared with Z-scores of other companies that eventually filed for bankruptcy in the past in the telecommunication industry.

The following three broad research questions will be examined.

i. The relationship between financial distress and corporate governance,

ii. The relationship between marketing strategies at the BOP, cash flow and financial distress, and

iii. The strength of z-score in predicting eminent distress and bankruptcy

1.2 Research Methodology

A number of financial ratios would be analysed to determine the internal liquidity, financial risk, operating performance and growth of the companies. This analysis would complement the use of the Z-score model as the Z-score does not directly tell for instance how well the managers operate the business. The capital structure of the firms will also be assessed because as more debt financing is used, the probability of financial distress and then bankruptcy increases. Such ratios as debt to equity ratio, interest coverage ratio and cash flow coverage ratio will be verified over the period. The impact of competition on revenue would be assessed in order to determine if the companies have sustainable growth rates and also look at the different strategies being employed to raise revenue, reduce cost or both in the mist of hyper competition in the sector and the low average revenue per user (ARPU) in the region. Since the market is entirely a BOP market, strategies at the BOP will be revisited.

The constitution of the various boards would also be examined to determine the experience and professionalism that each of the board members brings to the board. The effectiveness of the board will be determined based on for example the existence of a corporate strategic document and evidence of implementation, and good corporate
governance. The thesis will attempt to establish if there is any qualitative relationship between financial distress, bankruptcy, competition and corporate governance.

1.3 Data Collection

Data sources for the thesis would be the National Communication Authority, The Registrar General Department, the United States Security and Exchange Commission (SEC), compilation from Journal Articles, interviews and/or questionnaires to the case companies and industry analysts’ reports. This work is based on earlier work by Altman E. (1968, 1982, and 2006), Beaver W. (1996) and others who research into the use of multivariate discriminate analysis to predict the probability of firm failure. This work will focus on the telecom industries in a developing economy and the model is applied to wholly own private companies which are not listed as compared to the listed manufacturing companies Altman used in his original study. This thesis also blends quantitative analysis with managerial and corporate governance issues, thus making it unique from other earlier works.

1.4 Research Motivation

This research is motivated by the share number of telecom bankruptcies in the past, especially between 2000 and 2002. Between 2000 and 2003, the likes of WorldCom (at the time the largest telecom bankruptcy in history and second only after the infamous Enron scandal), Adelphia Communications and Global Crossings filed for bankruptcy. The recent bankruptcy filing by Canadian telecom equipment supplier, Nortel also raised a lot of eyebrows couple with the recent not encouraging world economy outlook. The entry of major players in the industry into emerging African markets and the entry of another mobile operator in the Ghanaian market, call for study into the financial health of the major players over time. The thesis therefore is motivated from various facets, that is financials, market structure, managerial competence and corporate governance.
1.5 Thesis Outline

Chapter 1 - Introduction: The introductory chapter will lay out the general structure and framework of the thesis. This chapter will also introduce some of the high profile bankruptcies in the past, in general and from telecom specific industries. The motivation and methodology and research focus will also be highlighted in this chapter.

Chapter 2 - Literature Review: This chapter will review, analyse and synthesize some of the earlier works on bankruptcy prediction models. A number of prediction models will be mentioned. The predictive power, the accuracy and shortfalls of some of the well known predictive models will be highlighted. The relationship between financial distress, competition and corporate governance will be delved into and general research findings brought out in this chapter. As a prelude to chapter three, financial ratio analysis, the Altman’s Z-score and Altman, Haldeman and Nayaranan’s seven variable model (Zeta Model) will be revisited and the three Z-scores \((Z_1, Z_2, \text{ and } Z_3)\) defined. The variables of the Zeta model will be mentioned and the predictive accuracy compared to that of the traditional z-score model.

Chapter 3 - Methodology and Analysis: This chapter will contain the analysis and present the results of the research findings. The Z-score, based on traditional financial ratios, of the three case companies will be computed from the financial statements and annual reports of the companies, and the result compared to other telecommunication companies that went bankrupt in the past. Results from corporate governance survey or questionnaire will also be presented in this chapter. No quantitative analysis will be carried out in relation to corporate governance and financial distress.

Chapter 4 - Research Findings: This chapter will contain the result of the research findings and serve as a link between the analysis, conclusions and recommendations for
future research. Findings in respect of the three main research problems will be mentioned in this chapter.

Chapter 5 - Conclusions and Recommendations for further research: This will be the concluding chapter and will focus on the research finding based on the initial hypothesis of the thesis. Recommendations for future research directions will also be highlighted in this chapter.
Chapter Two

2.0 Literature Review

The prediction of eminent failure or bankruptcy of a business is of importance to investors, creditors, suppliers and customers. Firm failure could be either economic, where a firm’s revenue cannot cover its cost or financial, which could be technical insolvency where the firm is unable to meet its current obligations even though its asset is more that its total liabilities or bankruptcy if a firm’s total liability exceeds its total assets, that is the net worth of the firm is negative. Whitaker R. B. (1999) found that firms enter bankruptcy as a result of economic distress emanating from decline in industry operating income and poor management, arising out of persistent negative operating income over a five year period. Altman (2006) assigned managerial incompetence as the most pervasive reason for corporate failures.

The prediction of bankruptcy arising from financial difficulties has been of interest to many researchers in the past. The use of financial ratios as predictors of corporate bankruptcy was first given a serious thought by William Beaver (1966). Beaver used a number of financial ratios from failed and non failed firms and concluded that some ratios are more predictors than others. In particular Beaver concluded that the ratio of annual cash flow to debt was the single best predictor of bankruptcy five years prior to official filing of bankruptcy.

Beaver’s statistical method was univariate, in that it used traditional financial ratio analysis, which ratios served as the explanatory variables or the predictors and these variables were observed one after the other. Thus the integrated effect of any set of ratios or variables is lost. Beaver’s univariate analysis assumed a linear proportionate relationship between a set of financial variables. This however is not always the case, since in most cases a constant may also play a role in the relationship between two financial variables. The potential errors
inherent in univariate analysis are minimized using multivariate analysis. Edward Altman (1968) first used the multivariate discriminant analysis to study a group of 33 failed and non failed firms and the result indicated a number of financial ratios that distinguished between failed and non-failed firms. These ratios cover areas of management efficiency, profitability, liquidity and gearing.

Robert Edmister (1972) produced a model based on seven financial ratios and combinatorial analysis of ratio trends and current levels, for testing failure of small businesses. (Sheppard, J. P., 1994) finds that there are basically four strategic factors that relates to organizational death (corporate strategy, market share strategy, cooperative strategy and financial strategy). All the above were found to be statistically significant factors in determining firm survival or failure.

2.1 Telecom Bankruptcy History

The history of bankruptcy in the telecom industry spans both operators and equipment manufacturers. There is little academic literature on the actual list of telecom bankruptcies around the globe. Many of the available literature are those from the United States of America. The bankruptcydata.com database reveals more than forty telecommunications companies in the US, with total assets more than $500 million that filed for any form of bankruptcy since 2000. In 2008, Harwaii’s largest telecommunication company filed for bankruptcy, having been acquired by Carlyle from Verizon Communications at $1.6 billion in 2005. Carlyle was reported (according to Standard and Poor’s) to have received more than $741 billion investment from private equity firms but the debt could not be managed as a result of economic downturn.
Table 2-1 shows a list of past telecom bankruptcies and the corresponding liabilities at the time of filling.

<table>
<thead>
<tr>
<th>Company</th>
<th>Date of Bankruptcy</th>
<th>Liability in United States Dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>WorldCom, Inc</td>
<td>Jul 2002</td>
<td>45.98 billion</td>
</tr>
<tr>
<td>Adelphia Communication Corp</td>
<td>Jun 2002</td>
<td>17.35 billion</td>
</tr>
<tr>
<td>Global Crossing Ltd</td>
<td>Jun 2002</td>
<td>14.64 billion</td>
</tr>
<tr>
<td>NTL, Inc</td>
<td>May 2002</td>
<td>14.13 billion</td>
</tr>
<tr>
<td>Williams Communication Group, Inc</td>
<td>Apr 2002</td>
<td>7.15 billion</td>
</tr>
<tr>
<td>XO Communication Group, Inc</td>
<td>Jun 2002</td>
<td>5.85 billion</td>
</tr>
<tr>
<td>Exodus Communications</td>
<td>Sep 2001</td>
<td>4.45 billion</td>
</tr>
<tr>
<td>Winstar Communications</td>
<td>Apr 2001</td>
<td>4.37 billion</td>
</tr>
</tbody>
</table>

Table 2-1: Sample past telecom bankruptcies  
*Source: Altman (2006) and [www.bankruptcydata.com](http://www.bankruptcydata.com)*

There is no official and documented evidence of a telecom bankruptcy in Ghana. However, the demise of a rural voice telephony provider, Capital Telecom, can be mentioned since the company is no longer operating. There is no records of bankruptcy processes followed by the small scale rural telecom provider neither is the total liability at the time of collapse known.

### 2.2 Bankruptcy Prediction Models

To date, bankruptcy prediction models have primarily used information from corporate financial statements and use such information as symptoms of firm failure, Beaver (1966), Altman (1968, 1982, 2006), Johnson (1972), and Ohlson (1982). Others constructed models based on causes of failures and other qualitative aspects, Nwogugu (2005), Coats (1993), Wilson & Shada (1994). These two frameworks, quantitative and qualitative approaches, have resulted in many bankruptcy prediction models, with each attempting to improve the accuracy of corporate bankruptcy predictions: Corporate bankruptcy prediction models can generally be categorized into three, that is Statistical models, Artificial...
Intelligence and Expert Systems (AIES) and Theoretic Models (Altman 2006) and Aziz (2006). Table 2-2 shows a number of models under each category

<table>
<thead>
<tr>
<th>Category</th>
<th>Models</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Statistical Models</td>
</tr>
<tr>
<td></td>
<td>• Univariate Analysis</td>
</tr>
<tr>
<td></td>
<td>• Multiple Discriminant Analysis (MDA)</td>
</tr>
<tr>
<td></td>
<td>• Linear Probability Models (LPM)</td>
</tr>
<tr>
<td></td>
<td>• Logit Models</td>
</tr>
<tr>
<td></td>
<td>• Probit Models</td>
</tr>
<tr>
<td></td>
<td>• Cumulative Sums (CUSUM) procedure</td>
</tr>
<tr>
<td></td>
<td>• Partial Adjustment Process</td>
</tr>
<tr>
<td>2</td>
<td>Artificial Intelligence and Expert Systems (AIES) Models</td>
</tr>
<tr>
<td></td>
<td>• Recursively Partitioned Decision Trees (Inductive Learning) Model</td>
</tr>
<tr>
<td></td>
<td>• Case Based Reasoning (CBR) Model</td>
</tr>
<tr>
<td></td>
<td>• Neural Networks (NN)</td>
</tr>
<tr>
<td></td>
<td>• Genetic Algorithm (GA)</td>
</tr>
<tr>
<td></td>
<td>• Rough Set (RS) Models</td>
</tr>
<tr>
<td>3</td>
<td>Theoretic Models</td>
</tr>
<tr>
<td></td>
<td>• Balance Sheet Decomposition Measure</td>
</tr>
<tr>
<td></td>
<td>• Gambler’s Ruin Theory</td>
</tr>
<tr>
<td></td>
<td>• Cash Management Theory</td>
</tr>
<tr>
<td></td>
<td>• Credit Risk Theories</td>
</tr>
</tbody>
</table>

Table 2-2: Bankruptcy Prediction Models


2.2.1 Use Of The Prediction Models In Research

Like univariate analysis, many of the other models are not without limitations. Such limitations range from difficulty in using the models to non-development of the models. Aziz (2006) identified for instance that Genetic Algorithms are difficult to tune and have no convergence criteria. Similarly, Balance Sheet Decomposition Measure (BSDM) focuses on changes in balance sheet figures with no care about the direction of the change. Cash Management also provides only qualitative explanations for corporate failures leaving out other quantitative aspects of corporate failure. Logit and Probit models perform best when the sample size is large and the error terms are not normally distributed.
Past studies in bankruptcy prediction models employed many of the models listed above with 64% of the studies opting for statistical models, 25% for AIES Models and 11% for Theoretic Models (Aziz 2006).

Figure 2-1: Proportion of models categories employed by past studies

It is clear that the use of statistical models dominate the bankruptcy research literature. Of all the statistical models, 30% of the studies employed multiple discriminant analysis (MDA), followed by logit models (21%). Neural network is ranked first amongst AIES models accounting for 9% share. Under theoretic models, Balanced Sheet Decomposition Models (BSDM) is employed the most with a share of 4.5%. Figure 2 shows the distribution of the models used in research areas and indicates that MDA remains the preferred choice for many researchers (Aziz M., Humayon A. (2006))

Figure 2-2: Proportion of models employed by past studies
2.2.2 Predictive Power Of The Prediction Models

Aziz M. and Humayon A. (2006) noted that the predictive power of the models a year prior to bankruptcy is highest for Gamblers’ Ruin (94%) followed by Rough Sets (91%), though the use of the two constitutes only 1.1% and 3.4% respectively in research studies. MDA and logit models prediction accuracies were 86% and 87% respectively. In particular case of the MDA model derived by Altman, the accuracy of the MDA was 95% in the first year prior to failure, 72% in the second year and a paltry 36% in the 5th year (Altman, 1968). Figure 2-3 shows the average predictive power of the models a year prior to failure. The predictive power of the models can also be assessed using misclassification errors. There are basically two type of misclassification errors, type I and type II errors. Types I errors measures the number of failed firms that are wrongly classified as non-failed firms by the application of a particular model. Type II errors on the other hand measures the number of non-failed firms that are classified as failed firms by the model. Aziz and Humayon noted that cash management models committed the worse type I errors (26%) with MDA and LPM committing type I errors of 15% and 3% respectively. Cash management models showed an average of 35% type II error misclassification with MDA and Logit models showing type II error rates of 12% and 10% respectively. In credit analysis, type I errors are more serious than type II errors, because misclassifying loan defaulters as non-defaulters could impact negatively on loan recovery and lowers accounts receivables. Neural networks predicted accurately the demise of many United States major airlines between 1999 and 2001.

![Figure 2-3: Predictive accuracy of bankruptcy prediction models](source: Aziz M., Humayon A. (2006))
Jeffry Haber (2005) wrote a strong critique of the dichotomous classification approach adopted in bankruptcy prediction research and described the models as ‘academic and totally useless for practical applications’. Jeffry contended the arbitrariness in the choice of ratios based on prevalence and popularity. His criticism also included the definition of bankruptcy, insolvency and liquidity. It should be noted, however, that bankruptcy models do not predict the actual bankruptcy filing and neither do they attempt to estimate survival probabilities or the time to corporate failure, as was suggested by Jeffry in his articles. MDA is further criticized by its violation of the multivariate normal distribution of independent variable assumption. Ohlson (1980) used the probit and logit models to avoid this criticism.

2.3 Financial Distress And Corporate Governance

According to organization theory, the performance of corporations depends on collaboration among top managers. Corporate governance and leadership plays important roles in fashioning corporate strategies and driving such strategies towards profitability and sustainability. Huang Hui & Zhao Jing-Jing (2008) identified eight independent variables for measuring the cost of financial distress based on corporate governance indicators. The eight variables were grouped into: \textit{shareholder structure, board structure, agency problems and controlling variables}. In reference to board structure and composition for instance, CEO & board chairman duality is not usually recommended as this creates conflict of interest and lack of effective leadership since the CEO is now accountable to himself. High insider representation on boards is usually associated with little or no board involvement in strategic decision making. Such a governance structure can be detrimental to the firm, especially during times of financial distress, when new thinking and turn-around strategies are needed.

Pfeffer (1972), Hambrick and d’Aveni (1988), and Gilson (1990) all find empirical evidence of association between firm performance, financial distress and bankruptcy and board composition and that an insider dominated board is a recipe for distress, as most inside
directors lack objectivity and independence. Rob Bauer et al (2008) find that well governed firms significantly performed better than poorly governed firms in Japan. An average differential of 15% points was found between the two firms, well governed and poorly governed, in terms of corporate performance. An empirical test by Huther J. (1997) finds that there are efficiency gains to be made by reducing the size of boards.

Fathi E. and Jean-Pierre (2001) find that the domination of boards by top management could lead to collusion and transfer of wealth from shareholders. John Pound (1995) also proposed a ‘governed corporation’, where board members are appointed based on their expertise and understanding of the industry. Such board members tend to support the CEO in achieving corporate targets, sustain profitability and therefore reduce the likelihood of financial distress and bankruptcy. John believed that most corporate failures are as a result of a few flawed decisions rather than incompetence. Jaw Lorch (1995), advocated performance monitoring by empowering outside directors to influence the strategic direction of the company, if they feel top management’s performance is deteriorating and if possible effect change of management to avoid collapse.

2.3.1 Leadership, Corporate Greed And Governance Practices

Financial fraud is one of the teething problems in the corporate world. It ranges from selling assets at below market price (tunneling) to controlling shareholders or other firms controlled by controlling share holders, to the detriment of minority shareholder, to accounting fraud. The existence of national laws such as fraudulent conveyance laws can protect the minority share holders and the firm from such wealth expropriation. Corporate greed causes predatory lending to the detriment of the consumer and increases consumer debts in the long run (Mark Johnson, 2008).

Dubrin (2006) identified a number of agency problem cases, including leadership and unethical behaviour that impact on corporate performance and eventual bankruptcy of the
firms in the cases. The cases included Sanjay Kumar, former CEO of Computer Associates, who was charged with security fraud, Kenneth Lay, former Chairman and CEO of Enron, who was charged with accounting fraud, Bernard Ebbers of MCI/WorldCom who classified $3.8 billion as capital expenses instead of operating cost and Gary Winnick, former CEO and Chairman of Global Crossing Ltd, who was also involved in accounting manipulations. It should be noted that these bad corporate governance practices led to the bankruptcy filings by Enron Corporation, WorldCom and Global Crossings Ltd subsequently.

John Colley et al (2005) identified eight key corporate issues that tend to impact on corporate performance and therefore erode the confidence of shareholders, customers, suppliers and creditors. Of significance is ‘board entrenchment’, where a large number of board members remain on the board for too long and have become static and therefore are no longer interested in pursuing corporate strategic goals. This attitude leads to board ineffectiveness, inertia, loss of focus and subsequent collapse of corporations. Another is ‘internal political and personal conflict’. Many a times, internal struggles, even on strategy formulation and implementation can lead to conflict among board members and when this happens they spend a lot of time resolving these issues instead of addressing potential crisis, if any, and thus prevent corporate inertia. A torn board will not act when it should. Dissatisfied directors may resign and thereby creating a negative publicity. Key customers will usually wait to see the next line of action before doing business with the corporation. The result is loss of customers, creditors, revenue and finally financial distress.

Often times, directors are responsible for determining CEO and top management pay and compensation. It is important CEO compensation be viewed critically to avoid unnecessary perking and inside trading, especially if the CEO hold stocks as he may take decisions not in the interest of the corporation as a whole but would tend to maximise shareholder wealth. The board, therefore, has a responsibility to make sure that issues
relating to agency cost are handled in the interest of the corporation and shareholders. By and large, good corporate governance within organizations usually promotes healthy cooperation from all stakeholders, management, customers, creditors and employees. The end result is growth sustainability and financial distress avoidance. James Moore (1993) posited that leadership is needed in competitive markets (ecosystems) to guide investment direction and technical standards, making sure that the organization has a community of suppliers and build management teams that can start a new ecosystem, when identified.

Africa’s perceived low standard of corporate governance practices relative to EU countries has remained a deterrent for foreign investment. Happily, however, many African countries, including Ghana, have since adopted many of the OECD and Commonwealth Association of corporate governance principles and have crafted them into laws backed by legislations. In Ghana, these legislations are enforced by the Security and Exchange Commission (SEC). However, the enforcement of the laws has been problematic, slow and patchy as a result of inefficient legal systems (Sam, N., Vimal, J. & Mark A., 2003). The perceived low standard of corporate governance is however refuted by Sam N. et al(2003), because their research findings do not support the assertion.

2.4 Competition In The Mobile Telecom Sector In Ghana

Ghana took the initial step and embraced the potential of competitive markets to generate revenue, improve quality of service, increase penetration, stimulate growth and introduce innovation in the telecom sector in August 1994. The liberalization of the telecom sector in Ghana effectively started in 1996 with the splitting of the then Post and Telecommunication Corporation into Ghana Telecom and Ghana Post. At the dawn of the split, the government of Ghana entered into a management partnership with Telecom Malaysia, with the later acquiring 30% shares in the company. At that time the main business was fixed line business, including international partnership with international voice carriers.
There was no broadband service at that time. That agreement also granted five year exclusivity to Ghana Telecom to provide fixed telephony services. Even though, another company, Western Telesystems (Westel) was also granted another license to provide fixed telephony services, its impact on competition was minimal as Ghana Telecom holds more than 98% markets share in the fixed line market.

Indeed the liberalization of the telecom sector has brought a lot of benefits to Ghana, both in social and economic contexts. Telephone services accessibility improved since 1996. According to the World Bank ICT indicators, mobile telephone subscribers per 100 people rose from 0.6, on average between 1995 - 1999 to 22.6% between 2000 and 2006. Over the same period, the cost of calls to the United States fell from 0.55 dollars per minute to as low as 0.13 dollars per minute. The population covered by mobile telephony was 30% in 2000 and rose sharply to 70% by end 2006. Service activation cost has also dropped from a high value of 65 dollars in 2000 to less than 2 dollars in 2006. Today, service activation cost is less than a dollar. The contribution of the telecom sector to GDP also rose from 1.8% in 2000 to 2.1% in 2002.

By 2004, there were five mobile operators, with four actively providing mobile services using various technologies\(^2\). By December 2008, National Communication Authority has licensed six companies to provide mobile telephony. Five of the operators(Ghana Telecommunication Company Limited - the incumbent, Millicom Ghana Limited, Scancom Ghana Limited, Kasapa Telecomm and CelTel) are actively operating whiles the new entrant, Globacom Limited is expected to launch operation by the last quarter of 2009.

2.4.1 Competition, Marketing Strategy And Revenue In The Low ARPU World

The communication sector in Africa in general and particularly in Ghana is largely underserved and formed part of the next 4 billion potential consumers at the bottom of the economic pyramid (BOP). Africa’s BOP constitutes about 71% of the consumer market. Of the more that 5 trillion dollar market available at the BOP, the ICT sector in Africa alone is worth 4.4 billion dollars out of the total BOP ICT expenditure of more than 51.4 billion dollars (Allen Hammond et al 2007). Figures 2-4 depicts the characteristics of the BOP. BOP markets have become very attractive to multinational companies because of the growth potentials it presented and the fact that existing markets are getting saturated (Prahalad C.K. and Hammond A., 2002). Despite its vast business growth opportunities, BOP markets are not without risk. As Anderson J. and Billou N.(2007) noted “corruption, poor infrastructure, non-existence distribution channels, illiteracy, lack of robust and enforceable legal frameworks, religious or racial conflict, and sometimes even war or violent insurgencies” stifle the enthusiasm of companies in entering and serving people living in BOP markets.

Figure 2-4: Income characteristics at the bottom of the economic pyramid (BOP)
Source: Allen Hammond et al (2007); World Economic Forum
Marketing activities are generally aimed at cash flow acceleration, cash flow enhancement, and reduction in volatility and vulnerability of cash flows, and growth in the long term value of the business. R. K. Srivastava (1997) identified three main sources of cash flow vulnerability and volatility (micro-environment, industry and the firm) which if not well managed could impact negatively on business performance and eventual distress and bankruptcy. A micro-environment risk variable such as the lifting of entry barriers could open the flood gate for many competitors and thereby increase the marketing cost in fighting competition.

2.4.2 Managing Vulnerability and Volatility in Cash Flow via Marketing Strategy

A number of marketing propositions have been made for markets at the bottom of the economic pyramid. Allen Hammond et al (2007) identified five strategies that create value and success at the BOP market. These strategies included, focusing on the BOP with unique products and services that are appropriate and meet the needs of the consumers at the BOP. For example, rural public phones, micro top ups for cellular prepaid users and per second billing for telephone usage. Another BOP strategy is local value creation by treating the communities as customers. An example is the numerous ‘table-top’ and ‘road-side’ resellers of top-up cards for cellular services, internet-based kiosks and agent based distribution channels.

The degree to which a marketing strategy is successful will be determined first by a number of marketing variables such as customer satisfaction, retention and quality. Success or failure will then be seen in financial performance and share holder value. The bottom up relationship between marketing strategy and share holder value is in the order: marketing strategy, cash flow, financial performance and shareholder value. Roger Best (2005) identified specific strategies to arrest cash flow vulnerability and increase growth profitably. Such strategies include strategies to grow market demand, strategies to increase market share,
strategies to increase revenue per customer, strategies to lower variable cost and strategies to increase market efficiency. Each of the above strategies is geared towards specific metric in the net marketing contribution equation. Figure 2-5 illustrates the relationship between the strategies and the metrics.

Figure 2-5: Relationship between Marketing Strategies and Net Profit (Net Marketing Contribution)

In addition to the above broad strategies, three key processes are also vital in reducing cash flow vulnerability, K. Srivastava et al (1997). They include

(i) managing product innovations and design and product portfolios, example is designing hard to copy products and high rate of product innovation;

(ii) Customer relationship management, example, customer retention, selectivity, customer acquisition and attraction

(iii) Managing demand delivery process and marketing initiatives: examples, achieving economics of scale, distributor conflict maximization and managing competition across, within delivery channels and brand positioning.
2.4.3 Profitability Strategies in Emerging and Low ARPU Markets

Are six mobile operators too much for a country of approximately 24 million people? That is the question many market watchers are asking. The telecom sector in Africa is characterized by low average revenue per user (ARPU), and the situation is not any different in Ghana. Over the past decade the industry has seen a decline in ARPU and many are dismayed at the turn of events. The declining ARPU in these regions (Africa, Asia Pacific) is as a result of subscriber growth and intense competition that has put pressure on operators to reduce price. Thus any marketing strategy should be geared towards generating positive average margin per user (AMPU) or profitability on the back of low ARPU. Figure 2-6 shows ARPU changes in selected Africa countries from 2006 to 2008.

![ARPU Change Table]

Figure 2-6: Changes in ARPU in selected African countries
*Source: ML Wireless Matrix January 2009, Pyramid Research December 2008*

AMPU is defined as the difference between ARPU and Cash Cost Per User (the initial cost of service (Capex) and ongoing cost (Opex) per subscriber or service. Therefore:

(i) An high ARPU does not guarantee a positive AMPU

(ii) On the other hand, low ARPU does not preclude positive AMPU. Low revenue users could be profitable as long as ARPU exceeds average cost per user

(iii) Positive ARPU does not mean profit
M. B. Herath (2007) proposed a model for doing business profitably in the low ARPU regions (Asia and Africa). The model has five fundamental cost drivers:

(i) Shifting focus from ARPU to AMPU
(ii) Identifying major cost drivers that affect AMPU, focusing on areas that operators have control
(iii) Reducing CAPEX and OPEX to achieve positive AMPU
(iv) Create ‘volume’
(v) Refining Continuously for Sustainability

Shifting focus from ARPU to AMPU allow operators to achieve profitability without necessarily increasing revenue substantially. Revenue, as forecasted by Oliver Wyman, will continue to decline in the next 5 years with 40% of operators’ revenue estimated to come from low income segments of the population compared to 20% today.

The main cost drivers that affect AMPU include network and capacity cost, marketing cost (subscriber acquisition and retention), administrative cost and bad debts. Marketing cost for instance can be reduced substantially in the low ARPU world by offering micro top up cards, some in denominations between half and 5 dollars. In Ghana, top up denominations as low as 50 cents are available for low income earners. Anderson J. and Billou N.(2007) argued that the 4As framework (availability, affordability, acceptability and awareness) have seen many corporation in the BOP market very successful. The 4As framework was developed to overcome some of the unique challenges in the low ARPU market, for example the difficulty in getting to the customer and making the customers aware of the product as in many cases, the consumers do not have access to conventional advertizing media.

Network cost constitutes a substantial portion of operators’ CAPEX and OPEX. Network sharing is one of the areas in which operators can achieve a lot of savings. A network sharing with a tenancy ratio of two would translate into a cost saving of about 20%. Despite this cost advantage, it is not until recently that Ghanaian mobile operators embraced network sharing. This is because the market leader feared losing its cost advantage by
lowering its competitors’ cost. Operators can further reduce network cost by leveraging economies of scale to lower cost through centralized purchasing of equipment via group procurement processes. Millicom Ghana and MTN Ghana benefit from this arrangement due to their Global presence.

The challenge with regard to OPEX is the fact that most Sub Saharan African countries don’t have a reliable electricity supply and many villages and towns are still without electricity. This situation imposes a high power cost on the operators, whiles serving the rural communities at the same time. OPEX reduction is further constrained by lack of cross border connectivity, compared to countries in Europe and Asia. A call between Ghana and any of its direct neighbours would have to transit through other operators in America and Europe, resulting in high inter-connects costs. Outsourcing back office operations can also reduce OPEX for operators. Such operations as, IT, Billing, Power and Auxiliary can make significance OPEX reductions as these costs are taken off the operators’ balance sheets.

Creating the optimal subscriber volume has become a big challenge for operators since the entry of more mobile operators. This is partly because low income earners and users don’t switch easily. Secondly, there is little in product differentiation within the Ghanaian market and all operators provide the same or similar products and services, except Ghana Telecom, which has monopoly in the fixed voice and broadband market. Thirdly, the market leader (MTN) seems to be enjoying positive network externality or demand side economies of scale as a result, most users would prefer to hook to their network. So then how do operators create the needed ‘volume’ at the BOP? Two models, the subscriber and minute models, have been proposed in a white paper delivered by IBM (A. Mahajan and S. Srikant, 2005)

‘Volume’ creation can be achieved by making products and services more affordable through the use of micro top ups, e-refills, vouchers etc. The distribution channel is also
important in making sure that the consumer has access to product and it is available when needed. Direct sales marketing channels is preferred as the operators now take control of product knowledge and quality, whiles lowering marketing cost, that would have potentially gone to marketing intermediaries. Operators could also create volume by offering high quality mobile handsets at affordable prices instead of allowing consumers to buy phones off the shelf.

The dominant strategies in the mobile telecommunication industries are driven primarily by models posited by Pankaj Ghemawat (2007). Ghemawat’s frameworks (ADDITION and CAGE) are relevant because the markets are different and African mobile markets are unique. For instance, in Europe, mobile penetration is over 90%\(^3\) and most markets are matured and saturated and therefore the dominant strategies towards profitability is product innovation and customer retention, where as in most African countries, including Ghana, the battle is to control market share and drive frequent usage.

It is important, therefore, that an operators profitability and cash flow vulnerability and volatility will largely depend on how efficient they adapt to adjust to market differences, aggregate to overcome all type of differences (cultural, administrative, geographic and economic) and arbitrage to profit from the inevitable imbalances between markets in Africa and the rest of the world. The crave for subscriber volume would result in a mixture of marketing strategies, both offensive and defensive. The adoption of frontal strategies by operators will eventually win them the battle (growth in subscriber volume) but may lose the war (no significant increase in profit margin), because of high marketing cost and immediate retaliation by the market leaders.

2.5 Financial Ratios, Discriminant Analysis And Prediction Models Revisited
(Altman’s Z-Score And Zeta Models)

As seen in 2.1, MDA, despite its shortcomings still dominates use in bankruptcy prediction literature. The core ingredients of MDA are financial ratios, confirming that financial ratios, ratio analysis, are still valuable tools for tracking financial health. James Ohlson(1980), used eight traditional financial ratios in his model and concluded that, total liability divided by total asset, current liability divided by current asset, size\(^4\) are the most predictors. Ratio analysis alone do not answer questions, they are there to assist in determining what questions to ask and where to look. The predictive power of any financial ratio depends on its ability to discriminate between (for example bankrupt and non-bankrupt) firm. Financial ratios application include, determination of internal liquidity, financial risk, operating performance and growth. Table 2-3 summarizes a number of financial ratios and their areas of application.

<table>
<thead>
<tr>
<th>Area of Analysis</th>
<th>Purpose of Analysis</th>
<th>Related Ratios</th>
</tr>
</thead>
</table>
| **Internal liquidity or Short term solvency** | Assesses firm’s readiness and ability to pay short-term liabilities | - Current ratio  
- Account receivable ratios  
- Inventory ratios  
- Payable ratios  
- Cash conversion cycle |
| **Financial Risk and Financial Leverage** | Evaluate volatility of equity returns caused by use of debt financing | - Debt to equity ratio  
- Interest coverage ratio  
- Cash flow coverage ratio |
| **Operating performance**         | Interpret how well management operates the business                               | - Asset turn-over ratio  
- Fixed asset ratio  
- Equity ratio  
- Profit margin ratios  
- Return on asset ratio  
- Return on owner’s equity ratio |
| **Growth**                        | Evaluate firm’s growth potential                                                   | - Sustainable growth rate  
- Retention rate |

Table 2-3: Financial Ratio Applications


\(^4\) Size in this context is defined as \(\log \left(\frac{\text{total assets}}{\text{GNP price-level index}}\right)\). The index assumes a base value of 100 for 1968.
Usually the financial ratios are interrelated and therefore are analysed in relation to each other. Changes in financial ratios and cash flow trend over time or compared to similar firms in the industry may indicate potential problems or symptoms in a specific area. For example, increasing or high current ratio indicates poor efficiency of working capital and related symptom could be high cash conversion cycle, low receivables turn over or low return on assets. Foster Benjamin and Ward Terry(1997) used trend and interaction between the three net cash flows and find that non-bankrupt firms usually have unstable trend with negative cash flows in the third, second and first years prior to bankruptcy. Table 2-4 shows samples of relationship among financial ratios.

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Diagnosis</th>
<th>Related Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increasing or high current ratio</td>
<td>Poor efficiency of working Capital</td>
<td>High conversion cycle, Low receivable turnover, Low return on equity, High payable turnover</td>
</tr>
<tr>
<td>Decreasing or low current ratio</td>
<td>Liquidity problems</td>
<td>High debt ratio</td>
</tr>
<tr>
<td>Increasing or high receivables turnover</td>
<td>Too restrictive credit policy</td>
<td>Low or declining sales growth</td>
</tr>
<tr>
<td>Decreasing or low receivable turn over</td>
<td>Poor management of receivables</td>
<td>High current ratio, high cash conversion, low total asset turnover, low return on equity, low equity turn over</td>
</tr>
<tr>
<td>Increasing or high inventory turnover</td>
<td>Inadequate stock on hand</td>
<td>Low or declining sales growth</td>
</tr>
<tr>
<td>Decreasing or low inventory turnover</td>
<td>Poor management of inventory, unable to compete effectively</td>
<td>High current ratio, high cash conversion, low total asset turnover, low return on equity, low equity turn over</td>
</tr>
<tr>
<td>Increasing or high payable turnover</td>
<td>Poor use of trade credit</td>
<td>High cash conversion cycle</td>
</tr>
<tr>
<td>Increasing or high cash conversion cycle</td>
<td>Poor efficiency of working capital</td>
<td>High current ratio, low receivable turnover, low inventory turnover, high payables turnover, low total asset turnover, low return on assets, low return on equity, low equity turn over</td>
</tr>
<tr>
<td>Increasing or high debt ratio</td>
<td>High use of leverage</td>
<td>Low interest coverage ratio, low cash flow coverage</td>
</tr>
<tr>
<td>Decreasing or low interest coverage ratio</td>
<td>High use of leverage</td>
<td>High debt ratio, low cash flow coverage</td>
</tr>
</tbody>
</table>

Table 2-4: Relationship among Financial Ratios  
It is evidenced from Table 2-4 that financial ratio analysis can be a herculean task in determining or predicting bankruptcy. Rather, these ratios are combined linearly using discriminant analysis, and predictors of financial distress. As will be seen in 2.4.1, financial ratios alone can be deceptive, especially when the book is ‘cooked’. Financial Analysis is based on the assumption that external auditors and board of directors have certified the annual financial report. However, this has not been the case as indicated earlier in chapter one, corporate scandals emanating from accounting fraud still exists. The use of MDA models minimized this problem.

2.5.1 Altman’s Z-Score Model

The Z-score model has undergone a number of variations aimed at improving the predictive power or accuracy of the model and to cater for non manufacturing and private firms, since it was first introduced in 1968, Altman(1968, 1982, 2006). Altman’s Z-score is a linear combination of a number of financial ratios, which would be described later. Altman defined the 1968 Z-score (for public manufacturing companies) as follows:

\[ Z = 0.012X_1 + 0.014X_2 + 0.033X_3 + 0.006X_4 + 0.999X_5 \quad \text{eqn (1)} \]

For private firms:

\[ Z_1 = 0.717X_1 + 0.847X_2 + 3.107X_3 + 0.420X_4 + 0.998X_5 \quad \text{eqn (2)} \]

For non-manufacturing firms, emerging markets and general use:

\[ Z_2 = 3.25 + 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4 + 0.998X_5 \quad \text{eqn (3)} \]

The cutoff points for the Z-scores are shown in table 2-5.

<table>
<thead>
<tr>
<th>Classification</th>
<th>Z-Score Models</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Z</td>
</tr>
<tr>
<td>Safe</td>
<td>&gt; 2.99</td>
</tr>
<tr>
<td>Gray</td>
<td>1.8 to 2.99</td>
</tr>
<tr>
<td>Distress</td>
<td>&lt; 1.8</td>
</tr>
</tbody>
</table>

Table 2-5: Z-Score cutoff points
$X_1, \ldots, X_5$ are financial ratios which are defined below:

- $X_1$: ratio of working capital to total assets;
- $X_2$: ratio of retained earnings to total assets;
- $X_3$: ratio of earnings before interest and tax (EBIT) to total assets
- $X_4$: ratio of market value of equity to book value of total liabilities
- $X_{4A}$: ratio of net worth to total liabilities
- $X_5$: ratio of sales to total assets;

$Z, Z_1$ and $Z_2$ are the respective overall indices.

**$X_1$: Working Capital/Total Assets (WC/TA):** Working capital is the difference between current assets and current liability. This ratio is a measure of net liquidity and as seen in Table 2-3 and Table 2-4, low WC/TA indicates liquidity problems. Ordinarily, a firm experiencing consistence operating losses tends to have diminishing currents assets relative to total assets. Likewise a firm with negative working capital usually has problems meeting its short term obligation as there are not enough current assets to cover them.

**$X_2$: Retained Earnings/Total Assets (RE/TA):** This is a leverage ratio and firms with high retained earning usually financed the business through accumulated profits. This ratio captures the age of the firm because established firms tends to have high retained earnings over the life of the business as compared to younger firms. Altman noted that this ratio does not discriminate against young firms. In the real world, younger firms are more likely to enter bankruptcy compared to older firms. Companies with high RE/TA ratio indicates years of profitability and hence less likely to face financial distress.

**$X_3$: Earnings Before Interest and Taxes/Total Asset (EBIT/TA):** EBIT is a measure of a firm’s profitability that excludes interest and taxes. It is obtained by subtracting operating expenses from operating revenue. This ratio measures management’s ability to squeeze
profits out of its available assets. It measures profit on each dollar of investment made by the firm.

**X4: Market Value of Equity/Book Value of Total Liability (MVE/TL):**

This ratio shows how much the firm’s assets decline in value before the liability exceeds the assets and the firm becomes insolvent. The market value of equity is obtained by multiplying the total number of preferred and common stocks by the share price. The total liability includes both short term and long term liabilities. Firms with high debt to equity ratio tend to move towards insolvency if earnings do not support the interest expense.

**X4A: Net worth/Total Liability (NW/TL)**

This ratio is appropriate for firms that do not list publicly. Instead of replacing the original X4 with zero (the market value of a firm not listed is theoretically zero), Altman, re-modeled the original Z-score and replaced X4 with X4A. A negative net worth indicates a non healthy firm since assets cannot cover the liabilities. Net worth does not take into account intangible assets such as goodwill, customer loyalty and intellectual property.

**X5: Sales/Total Assets (Sales/TA):** This ratio measures management efficiency in generating sales from available assets. It also measures the firm’s competitive ability, as it relates to sales of products. The higher this ratio the better it is for the firm.

Despite the overwhelming acceptance of the Z-score model (MDA) both in research and practical application, some researchers for example Gombola et al(1983) argued that the omission of cash flow ratios in bankruptcy studies is inappropriate. However, studies by Gentry, Newworld and Whitherford (1985) and Cornelius and Norman (1985) showed that the inclusion of the cash flow ratios did not significantly increase the classification, bankruptcy or non-bankruptcy. Einsenbeis, R. (1977) also criticised the numerous violations of standard multiple discriminant analysis rules and assumption as well as the transformation of certain variables, such as firm size and population using logarithmic function.
2.5.2 The Seven Variable (Zeta) Model

In a bid to improve the prediction accuracy of the Z-score model, the Zeta model was developed as an enhancement to the Z-score by Altman, Haldeman & Nayaranan(1977). The Zeta model is capable of predicting bankruptcy up to five years compared to two years in the case of the traditional Z-score model. Table 2-6 shows the predictive capability of both Z-Score and Zeta models.

<table>
<thead>
<tr>
<th>Years prior to Bankruptcy</th>
<th>Zeta Model</th>
<th>Altman Z-Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bankrupt (%)</td>
<td>Non-bankrupt (%)</td>
</tr>
<tr>
<td>1</td>
<td>96.2</td>
<td>89.7</td>
</tr>
<tr>
<td>2</td>
<td>84.9</td>
<td>93.1</td>
</tr>
<tr>
<td>3</td>
<td>74.5</td>
<td>91.4</td>
</tr>
<tr>
<td>4</td>
<td>68.1</td>
<td>89.5</td>
</tr>
<tr>
<td>5</td>
<td>69.8</td>
<td>82.1</td>
</tr>
</tbody>
</table>

Table 2-6: Predictive capability (percentage accuracy) of Z-Score and Zeta Models

Source: Altman, 2000

The linear Zeta-model is specified as:

\[ \text{Zeta} = a_1X_1 + a_2X_2 + a_3X_3 + a_4X_4 + a_5X_5 + a_6X_6 + a_7X_7 \]

where \(X_1, \ldots, X_7\) are:

- \(X_1\) = return on assets (the same ratio as \(X_3\) in the Z-Score Model)
- \(X_2\) = earnings stability (the deviation around a ten-year trend line of \(X_1\))
- \(X_3\) = debt service or interest coverage ratio
- \(X_4\) = cumulative profitability (the same as \(X_2\) in Z-score)
- \(X_5\) = liquidity (measured by the current ratio)
- \(X_6\) = the ratio of equity to debt (using market values and a five year trend)
- \(X_7\) = firm size (measured by the \(\log_{10}\) of the firm’s total assets).

The relevance of the financial variables \(X_1 \ldots X_6\) can be found in section 2.4. Since the Zeta model is a proprietary model, the coefficients \((a_1, \ldots, a_2)\) are not available for academic
research, but are available via a subscription to Zeta Services\(^5\). The development of the zeta model was motivated by changes in financial reporting, increase in the size of businesses and the need to model around non manufacturing companies (Altman, 2000). The Zeta score model is centered on zero and score less than zero indicated financial distress. The Zeta model successfully predicted several failed airlines in the United States between 1999 and 2001 (Altman, 2006) and Gritta R (1982).

Though the Z-score was originally meant for credit analysis, distress firm analysis, and merger and acquisition analysis, the model has gained prominent in recent years as a strategic assessment and performance management tool, especially for turnaround managers who want to manage their firms by the numbers (Joseph C. 2007). In a landmark turnaround management at GTI corporation, Altman and La Fleur used the model to revive the ailing GTI corporation from financial difficulties before it was sold, even the decision to sell was triggered by the active application and use of the Z-score model (Altman, E. I. and James La Fleur, 1981) and Michael Ball (1981).

\(^5\) [http://zetascoring.com/index.htm](http://zetascoring.com/index.htm)
Chapter Three

3.0 Research Methodology

This thesis uses the descriptive approach to research design. This approach was chosen because of the nature of the research questions. The test of the Z-score involves collection of data and is a well structured methodology and has precise rules and procedures. Similarly, corporate governance effectiveness measurement has precise rules and procedures, at least many researchers agreed on several common key corporate governance indicators. The questions were selected from a pool of widely accepted corporate governance rules and the same questionnaire was sent out to all the respondents. The case design can best be described as ‘modified single case’ this is because one of the cases is critical and meets all the conditions necessary to test, confirm and challenge the research problems, where the others serves as a baseline (Pervez G. & Kjell G. 2005).

3.1 Data Collection

For this research, data was sourced from various sources, both primary and secondary. The choice of the case companies was based on their respective positions by market share. The case companies are the top three leaders by market share in the mobile industry in Ghana. Secondly, none of the case companies are listed on the Ghana Stock Exchange. Primary data was collected by means of a survey (questionnaire) to board members and top management team of the case companies. A population size of 60 was estimated (15 board members and 5 top management team members for each of the case companies). A sample of 13 respondents each was selected from each case company and the questionnaire administered by email. The questionnaire survey is based on methods employed by Sang-Woo Nam & Il Chong Nam (2004), recommendations for diagnosing a board by Salmon Walter J. (1993) and the OECD principles of corporate governance. The length of the
The questionnaire is made simple and short to make it suitable for very busy executives and board members, the targets of the survey.

The questionnaire consisted of three parts. Part one consisted of company profiles and board structure. Part two consisted of twenty three questions for diagnosis the board. The respondents were asked to respond using a list of five choices, based on the extent to which respondents agree with the questions or statements. Part three consisted of measures to enhance board effectiveness and performance. This part consists of nine questions and the respondents were provided with a list of statements, geared towards enhancing board performance. Respondents were asked to respond using a list of five choices, based on the extent to which respondents agree with the questions or statements. See appendix A for a sample survey questionnaire used to collect the data or information. As a follow up to low scores registered by one of the case companies, a follow up telephone calls were made to three of the senior managers to elicit extra information.

Secondary data such as company financial statements of the case companies were sourced from the companies and other documents lodged with the National Communication Authority and the Registrar General’s Departments. Others, such as the z-score of past telecom bankruptcies were sourced from industry analysts’ reports, journal articles and the United States Security and Exchange Commission’s company fillings database. The financial statement data covers the period 2005 to 2008. This period was chosen because of data availability and the fact that the z-score model accuracy diminishes beyond five years prior to distress or bankruptcy. Many other sources of secondary data were stated in the literature review and the sources identified.

The data analysis is composed of two parts: corporate governance questionnaire data and the analysis based on the z-score of the case companies. The data will be presented in
aggregate and the case companies will not be identified, as this was part of the agreement reached with the case companies and many of the respondents.

### 3.2. Data Analysis: Corporate Governance

In all, thirty nine questionnaire were administered. The distribution of the questionnaire and the target respondents and responses received per case company is shown in Table 3-1. The share holding structure of the companies are as shown in table 3-2.

<table>
<thead>
<tr>
<th>Case Company A</th>
<th>Case Company B</th>
<th>Case Company C</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. Of Q’nnaire administered</td>
<td>No of responses</td>
<td>No. Of Q’nnaire administered</td>
</tr>
<tr>
<td>Board Members</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Senior Management</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>13</td>
<td>9</td>
</tr>
</tbody>
</table>

Table 3-1: Number of questionnaire administered and responses received

*Source: Author’s compilation from questionnaire survey*

<table>
<thead>
<tr>
<th>MTN Ghana</th>
<th>Millicom Ghana</th>
<th>Ghana Telecom</th>
</tr>
</thead>
<tbody>
<tr>
<td>Majority Share Holdings</td>
<td>MTN Group (98%)</td>
<td>Millicom International Cellular S. A.(100%)</td>
</tr>
<tr>
<td>Minority Share Holdings</td>
<td>Others 2%</td>
<td>none</td>
</tr>
</tbody>
</table>

Table 3-2: Share Holding Structure of Case Companies

*Source: Author’s compilation from Group Annual Reports and Financial Statements*

A total of 24 responses, representing 61.5% was received. The score of each question per case company response to questions relating to board structure, composition and governance practices is shown in table 3-3. The score for each case company is computed by averaging the responses by the respondents from each case company. All figures are rounded off to the
nearest whole number. A score greater than 104(90%) is recommended as a good governance score by Salmon W. J., (1993). However, in analysing scores less than 100%, one should be very careful and particular about the type of governance issues that drive the scores down. This is because in the corporate environment, some questions or issues will carry more weight than others. The weighting method was adopted by San-Woo, N. & Il Chong, N. (2004) and Klapper and Love (2002).
<table>
<thead>
<tr>
<th>Question for Diagnosing Your Board</th>
<th>Average Score based on responses</th>
<th>Comp. A</th>
<th>Comp B</th>
<th>Comp C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are there three or more external directors for every inside directors?</td>
<td></td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Are the insiders limited to the CEO, the COO, and the CFO?</td>
<td></td>
<td>5</td>
<td>5</td>
<td>3</td>
</tr>
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<td>Do your directors routinely speak to senior managers who are not represented on the board?</td>
<td></td>
<td>5</td>
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<td>4</td>
</tr>
<tr>
<td>In your board the right size (8 to 15 members)?</td>
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<td>5</td>
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<td>Does your audit committee, not management, have the authority to approve the partner in charge of auditing the company?</td>
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<td>Does your audit committee routinely review “high exposure” areas?</td>
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<td>5</td>
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</tr>
<tr>
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<td>5</td>
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<td>Is there sufficient meeting time to thoughtful discussion in addition to management monologues?</td>
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<td>Do you take the right measures to build trust among directors?</td>
<td></td>
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<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Have you ever seen a copy of the corporate strategic document(s)?</td>
<td></td>
<td>4</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total Average Score</strong></td>
<td></td>
<td><strong>107</strong></td>
<td><strong>100</strong></td>
<td><strong>76</strong></td>
</tr>
</tbody>
</table>

Table 3-3: Average score of each case company per question: diagnosing the board

*Source:* Author’s compilation from questionnaire survey
Close to 96% of the respondents gave high assessments of their respective boards in terms of board structure and composition as evidenced in the high scores from questions 1 to 5. The low score from company C was the fact that the human resource director and company lawyers were ‘active’ members of the board. Company C’s low score on question 9 was attributed to the fact that, two of the company’s three strategic business units ended up establishing ‘boards’ there by creating parallel powers within the organization.

As shown in table 3-4, many of the respondents agreed with majority of the questions and propositions for enhancing board performance. Not too surprising, company C’s score for this part of the questionnaire was very high, with more than 96% of respondents going for the highest score for each question. A total score of between 45 and 40 is acceptable.

<table>
<thead>
<tr>
<th>Tasks to Enhance Board Performance</th>
<th>Average Score based on responses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Comp A</td>
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</tr>
<tr>
<td>6 Formal annual evaluation of the board of directors</td>
<td>5</td>
</tr>
<tr>
<td>7 Formal CEO evaluation by the board of directors</td>
<td>5</td>
</tr>
<tr>
<td>8 Giving independent directors better compensation and linked such compensation to performance</td>
<td>5</td>
</tr>
<tr>
<td>9 Better disclosure of board activity</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total score</strong></td>
<td>43</td>
</tr>
</tbody>
</table>

Table 3-4: Average score of each case company per question: enhancing board performance

*Source: Author’s compilation from questionnaire survey*

The data contained in this analysis has a limitation is the sense that, the responses were based on the subjective responses by board members and senior managers. Further, firms with good governance practices will be more than willing to provide more and accurate information than firms with poor corporate governance practices, especially from board members. This is evidenced in the responses from company C’s board of directors in table 3-1.
3.3 **Z-score Analysis**

As seen in chapter 2, the z-score can be used as a measure of firm performance and distress measurement. This section uses financial data derived from company annual reports. $Z_2(eqn(3))$ will be applied to the data because of three reasons. First, mobile telecommunication companies are non-manufacturing. Second, the data set is from or the companies are operating in an emerging market and thirdly none of the three case companies are listed on the Ghana Stock Exchange (GSE). Even though the group companies of two of the companies are listed outside Ghana, these listings do not invalidate the choice of the model, since the data set is specific to the local companies.

### 3.3.1 Market Share

The figure below shows the market share holdings of the case companies over the last four years. MTN Ghana is the market leader with a share of 52%, followed by Millicom Ghana 23% and Ghana Telecom 14%. MTN Ghana operates under the brand name - MTN\(^6\), Millicom Ghana under the brand name (tiGO)\(^7\), whiles Ghana Telecom operates under the brand name (OneTouch).\(^8\) The mobile market is sized 15million subscribers by end 2012.

**Figure 3-1: Mobile Telephony Market Share in Ghana**


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\(^6\) The firm previously operated under the brand names *Spacefon* and *Areeba* before acquisition by MTN group

\(^7\) The firm previously operated under the brand names *Mobitel* and *Buzz*

\(^8\) Ghana Telecom has since April 2009 been operating under the brand name- vodafone, after the acquisition of 70% stake by Vodafone Plc in August 2008
3.3.2  Z-score Analysis of Company A

Company A has strong financials as shown in its z-score over the period. Its current ratio over the period is solid, indicating the company’s ability to pay for short term obligations. Its average current ratio of more than 1.94 is more than the industry average of 1.10. A strong working capital management is revealed in its positive $X_1$ over the period. The company’s profitability is also revealed via positive and increasing $X_2$ and $X_3$. Figure 3-2 shows the discriminant financial ratios and the corresponding z-scores over the period 2005 to 2008.

![Company A Z-score Ratio Analysis](image)

**Source:** Authors compilation from Company A annual reports

3.3.3  Z-score Analysis of Company B

Though company B has negative working capitals over the period, the company managed to move from an inflection point in the year 2005 to achieve high z-scores in subsequent years. This is due to strong and consistent ability to generate the needed revenue and profit, as indicated in the $X_3$ values over the period. The negative working capital ratio($X_1$) is not too extreme to make the company insolvent in the short term. Figure 3-3 shows the z-score ratios and the corresponding z-scores from 2005 to 2008.

<table>
<thead>
<tr>
<th>Ratio</th>
<th>3 Year Average</th>
<th>Industry Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>1.94</td>
<td>1.10</td>
</tr>
<tr>
<td>Debt to Equity</td>
<td>66.47</td>
<td>0.69</td>
</tr>
<tr>
<td>Interest Coverage</td>
<td>571.21</td>
<td>20.50</td>
</tr>
<tr>
<td>Asset Turnover</td>
<td>1.31</td>
<td>0.60</td>
</tr>
</tbody>
</table>
3.3.4 Z-score Analysis of Company C

Company C has persistent poor working capital management over the period, with some improved result in 2008. However, the firm since 2006 made losses persistently due to inability to generate the needed revenue and inefficient use of assets. The company is unable to meet its short term and long term obligations as revealed by $X_1$ and $X_4$. The average current ratio of 0.43 over the period is lower than the industry average. The company entered an inflection point in 2005 and has since not recovered. Company C can be described by all financial standards as a going concern, with serious financial difficulties. Figure 3-4 shows the z-score ratios and the corresponding z-scores of company C from 2005-2008.

---

### Key Financial Ratios

<table>
<thead>
<tr>
<th>Ratio</th>
<th>3 Year Average</th>
<th>Industry Average</th>
</tr>
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<tbody>
<tr>
<td>Current</td>
<td>0.43</td>
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<td>Debt to Equity</td>
<td>4306.49</td>
<td>0.69</td>
</tr>
<tr>
<td>Interest Coverage</td>
<td>4.44</td>
<td>20.50</td>
</tr>
<tr>
<td>Asset Turnover</td>
<td>0.46</td>
<td>0.60</td>
</tr>
</tbody>
</table>
Chapter Four

4.0 Research Findings

Three broad research areas were considered: the relationship between financial distress and corporate governance, relationship between marketing at the BOP and the strength of the z-score in predicting eminent financial distress.

According to table 2-5, a $Z_2$ score greater than 2.6 is a safe zone, less than 1.10 is a distressed zone and between the two extremes is a gray zone. The research findings are presented per each case company.

4.1 Research Finding - Case Company A

Company A has strong z-scores, with z-scores greater than 12, and therefore not likely to face financial distress in the short to medium term. To the extent that the three year average current ratio of 1.91 is more than the industry average of 1.10, company A is able to meet all its short term obligations. The high asset turnover ratio indicates management’s efficiency in generating sales from its assets. Interest coverage ratio is higher than the industry average indicating company A’s ability to make interest expense or pay for financing cost and avoid default. Though the debt to equity ratio of company A is more than the industry average, its strong cash flows reduces the likely risk of default, as a result of increasing debt financing. The Z-score therefore confirms the strong financial health of company A.

4.2 Research Finding - Case Company B

Company B, though recorded a z-score of 0.48 in 2005, the managers managed to turn around the company between 2006 and 2008, moving the firm out of the distress zone in 2007. More than 80% of the company’s total debt is made up of current liabilities. It is therefore not surprising that the firm has a low current ratio compared to the industry average.
The lower than industry average of its interest coverage ratio is because of its low EBIT compared to interest expense or financing cost. The asset turnover ratio of 0.46, close to industry average of 0.60 indicates the firm ability to generate enough sales from its assets. The debt to equity ratio using only long term debt is about 975. This is still higher than the industry average of 0.60. The higher use of debt could be problematic unless the company wants to utilise the advantages associated with increasing use of debt (Modigliani and Miller Proposition II). This not too impressive results is confirmed by the low average z-score of 2.83 over the last three years, just less than 8% above the distress safe zone.

4.3 Research Finding - Case Company C

Company C entered an inflection point in 2005 with a z-score of 2.55. One would have expected that the managers of the firm would quickly turnaround the firm in subsequent years to improve the z-score (move the firm out of the gray zone). Unfortunately, the z-score of company C deteriorated further and never recovered till 2008, when the worse z-score of (-3.17) was recorded. The huge positive improvement in z-score from 2006(-2.04) to 0.40 in 2007 could not be sustained. Company C’s current ratio of 0.44 is less than the industry average. For the entire 4 year period under study, company A’s debt exceeded its total revenue.

A negative interest coverage ratio implies the firm could find it extremely difficult to fulfill its interest obligations. A default is highly probable. The increasing debt to equity ratio over the past three years implies the firm was highly financed by debt, without accompanying earnings. Its asset turnover ratio is below the industry average, indicating inefficiency in generating sales from its assets, largely financed by debt. Four consecutive years of negative working capital coupled with three consecutive years of negative net worth and EBIT, are the key ratios recorded by company C. Again the z-score accurately classified the financial difficulties of company C, with average z-score of negative 0.57(-0.57) over the
four year period. The average for the last three years is negative 1.67(-1.67). The two figures are in the distress zone.

The demise of company C may be as a result of inefficient marketing strategies. As shown in figure 3-1, it is likely that company C could not create the needed volume of customers needed to generate enough revenue and cash flows. While Companies A and B gained market share between 2006 and 2009, company C lost substantial market share. The annual reports of company C did show that marketing and administrative expenses increased over the period but this did not translate into holding or increasing the existing market share. All the strategies needed to compete in the emerging BOP market eluded company C.

Company C did not filed for bankruptcy officialy, but is it clear from the research findings and the analysis that the firm was in distress. In order to turn the company around, 70% of its shares was sold to an investor in August 2008. To confirm further the strength of the z-score in predicting eminent failure, the z-scores of WorldCom, Adelphia and Global Crossing, three troubled telecom companies in 2000/2002, were compared to that of company C. Figure 3-5 shows the z-scores of company C, WorldCom, Adelphia and Global Crossing.

![Comparison of Z-scores](image)

Figure 4-1: Comparison of z-scores of company C, WorldCom, Adelphia & Global Crossing

Sources: Fortios, C. H.(2004) & Author’s compilation from annual reports
Clearly, the performance of company C is no better than the three companies above and it is even worse than the three companies. As earlier reviewed in the literature, accounting fraud and bad corporate governance practices accounted for WorlCom’s demise in 2002. In section 3.2, company C scored the lowest score in the corporate governance case, with a score of 76 out of a maximum score of 115. The research findings therefore confirm a direct correlation between corporate governance and financial distress.
Chapter Five

5.0 Conclusions and Recommendations for Future Research

This thesis is based on three main research questions and methodologies. First, to test the use of Altman’s z-score in predicting financial distress. Second is to assess the impact or the relationship between marketing strategies in emerging markets at the base of the economic pyramid (BOP) and cash flow hence financial distress. And finally, we explore the relationship between corporate governance practices and financial distress. Has the research achieved all or some of its goals? What are the limitations and the new insight in the area of bankruptcy research?

5.1 Conclusions

Three case companies were used in this research. The findings of the corporate governance survey confirmed that there is a relationship between corporate governance and corporate performance or financial distress. Where as one of the case companies showed positive direct relationship (good corporate governance and strong financial performance), another case company showed a negative direct relationship (bad corporate governance and financial distress). Thus the first research question is answered and confirmed earlier research findings.

Even though, there was no quantitative analysis of the marketing strategies, it is clear from the author’s observation of the mobile telecommunication industry in Ghana that creating the needed volume and cost reduction is the key strategies here. Two of the case companies are part of a bigger company and therefore benefited from group policies, such as centralized procurement, the use of tested marketing strategies and positive network externality. These advantages over company C resulted in increasing market share at the expense of company C’s declining market share, decreasing ARPU and increasing cost to
fight competition by expanding network infrastructure, largely financed by debt. The second research question is also answered, though not strongly backed my marketing data.

The test of the z-score using financial data from the case companies proved positive and confirmed the financial health or status of the case companies. The z-score therefore accurately confirmed the insolvency in one of the case companies and classified another as financially strong. These finding were further corroborated by financial ratio analysis and industry ratio comparison. The last research question, which is central to the thesis, is also answered and that the z-score can be used in emerging market economies at the BOP. It further confirmed the use of the z-score for non-public and non-manufacturing companies operating in emerging markets.

5.2 Recommendations for Future Research

The thesis uses only three out of the five active mobile telecommunication providers in Ghana. Based on the findings and conclusions, it is recommended that the research be expanded to cover the other operators, especially when a new entrant is expected in the market by first quarter 2009. Whereas this research is based on an existing model, it is recommended that future research should attempt to build a model specific for the telecommunication industry in emerging market economies or explore further the seven variable models or use AIES to derive a model for the telecommunication industry.

Future research should be expanded to cover other telecommunication service providers because the technological convergence would mean the providers losing customers to the big players, who may be willing to provide similar services at competitive prices thus increasing cash flow volatility and variability of the smaller telecommunication companies. A separate research on impact of competition in the telecom industry in Ghana or telecom incumbent strategies in emerging markets is also recommended, especially to assess the
competitive impact of telco acquisitions by big multinationals (MNCs) in Africa. A research into corporate governance practices in non-listed telecom companies, using existing approaches will also enhance the content and finding of this research work.
Appendix A: Survey Questions

Questionnaire Survey on Corporate Governance Practices within the Mobile Telecom Industry in Ghana

To the respondents

Thank you very much for your willingness to join this survey. This survey is being conducted at the request of a student as part of his Master’s thesis research at the Blekinge Institute of Technology, Sweden (http://www.bth.se/eng/), with a view to find out corporate governance practices within your organization over the past three years.

The survey is asking questions on the practices in your firm/organization, regardless of the laws and regulations. Your accurate and frank response is key. The results will be used only for research or academic purposes and be presented only in aggregate without being revealed to any other third party.

Please enable macros to fill in the form

Part 1 Company Profile

Name of Company:

Date of Incorporation:

Governance Structure:

1. Wholly Owned Private Company
2. Government
3. Partnership with Government

If 3 above, please state the share holding structure: Government Others
**Part 2 Governance Practices**

*Please check the appropriate box (one option only) to express the extent to which you agree or disagree on the given statements*

<table>
<thead>
<tr>
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<td>23. Have you ever seen a copy of the corporate strategic document(s)?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Part 3 Priorities For A More Effective Board

Please check the appropriate box (one option only) to express the extent to which you agree or disagree on the given statements (5 - Strongly Agree, 4 - Agree, 3 - Neither Agree nor Disagree (no opinion), 2 - Disagree, 1 - Strongly Disagree). These questions sought your opinion on the following tasks to enhance board effectiveness and performance

<table>
<thead>
<tr>
<th>Tasks to Enhance Board Performance</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
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<tbody>
<tr>
<td>1 Selecting/appointing more of better qualified, truly independent directors</td>
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<td></td>
</tr>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>7 Formal CEO evaluation by the board of directors</td>
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<td>8 Giving independent directors better compensation and linked such compensation to performance</td>
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<td>9 Better disclosure of board activity</td>
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References


