UNIVERSITY OF CAPE COAST

THE RELATIONSHIP BETWEEN DETERMINANTS OF WORKING CAPITAL MANAGEMENT AND FINANCIAL DISTRESS LEVELS OF THE LISTED MANUFACTURING COMPANIES IN GHANA

ERIC KORKOR AGGREY

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BY

ERIC KORKOR AGGREY

Thesis submitted to the Department of Accounting and Finance of the School of Business, University of Cape Coast, in partial fulfilment of the requirements for the award of Master of Commerce Degree in Finance.

JUNE, 2015

DECLARATION

CANDIDATE'S DECLARATION

I hereby declare that this thesis is the result of my own original research and no part of it has been presented for another degree in this University or elsewhere.

Candidate's Signature……………………………. Date……………………….

Name: Eric Korkor Aggrey

SUPERVISORS' DECLARATION

We hereby declare that the preparation and presentation of this thesis was supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

Principal Supervisor's signature……………………Date……………

Name: Dr. Mohammed Ishaaq Zangina

Co-Supervisor's Signature……………………Date…………………..

Name: Dr. Anokye Mohammed Adam

ABSTRACT

This study investigates the relationship between Working Capital Management (WCM) determinants and financial distress level of the listed manufacturing companies in Ghana. This research used evidence from financial report of ten manufacturing organizations selected from the main board of the Ghana Stock exchange. Quantitative research approach involving panel least square estimates with white cross section were used for analysis. Descriptive statistical analysis including regression and correlation analysis were also used. The key finding of this research was that returns on asset, size, growth, and current ratio as well ascash conversion cycle as internal determinants of working capital have significant relationship with financial distress level of listed manufacturing companies in Ghana. Also, Interest rate and market value of equity as external determinants of working capital have significant influence on financial distress. The study also found that current liability and current asset as a major components of working capital have significant relationship with financial distress and that financial distress level of selected firms can be measured using working capital determinants through accounting based models. In conclusion, working capital determinants have significant relationship with financial distress and if manufacturing firms in Ghana can manage their working capital efficiently, they can escape financial distress which is one of the key symptoms that herald corporate failure.

ACKNOWLEDGEMENTS

I would like to extend my deepest appreciation to my thesis advisors, Dr. Zangina, Mohammed Ishaaqand Dr. AnokyeMohammedAdam; without them I would not have completed this study. Their expertise guided me through massive amounts of corrections, constructive criticisms and terms that were most unfamiliar to me, and their kindness and concern for my wellbeing extended far beyond that of the programme requirements. I am forever grateful to Dr. AnokyeMohammedAdam who introduced me to eview software that enables me to perform the analysis. Also I would like to thank University of Cape Coast for offering such a challenging and enriching programme, and I hope that the Master of commerce programme continues to grow and prosper. To my fellow classmates of Finance class, you have motivated, inspired, and taught me more than you know. I expect that in the upcoming years our ability to spend time together will lessen as the responsibilities of life begin to pull us in our separate ways, but my memories of our first meeting through our last goodbye will not diminish. My prayers will always include your continued well- being, happiness, health, and success.

Finally I would like to thank my family for their understanding and support as I tried to balance work, family, and a master programme. After completing this programme I now know that the most important title I will ever have is not master, but still daddy. Even though the scripts have gone through the hands of my thesis supervisors, all imperfections remain exclusively mine and I will appreciate, if my attention is drawn to any of such imperfections.

DEDICATION

To my friends, Koomson, Edward, Christopher and to my family, Gladys, Ernest,

Eliana and Fedora I dedicate this research work.

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INTRODUCTION

Background to the Study

Working capital mismanagement which eventually lead to financial distress and corporate failure is one of the major causes of job insecurity and unemployment all over the world in recent times (Ko, Blocher& Lin, 2013). Corporate failure is a situation in which a firm ceases to operate either permanently or temporarily as a result of naturally or artificially created unfavourable business environment. One of the key symptoms of corporate failure is financial distress. According to Pandey (2005) financial distress, is the inherent possibility that a firm may face a tight business conditions and thus have difficulties in paying owed amounts as and when they fall due. The financial distress and its socio-economic consequence of public or private corporate failure or bankruptcy usually have a debilitating negative effect especially for the stakeholders of such companies.

Miller (2006) made evidence of the difference between four possible strategic syndromes of failure. Two of them are of interest to this research because they have a long-term strategic perspective and can be the symptoms of early impairment for financial distress. The first syndrome is when a company does not recognize the change in the upward trend of overall economic development. This can happen if the management become over ambitious undertakes incautious expansion of working capital and if the diversity in the firm's markets grows faster than the information system of the company. In this situation, the firm is unable to anticipate changing conditions and properly adjust its growth strategy. The second syndrome is just the

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opposite of the first and implies that managers overestimate the stability of the current economic situation. They are convinced of the results of pursuing the same strategy of the past and disregard that a sudden change of economic conditions can turn success into failure. In this case financial distress and corporate failure arose when working capital which is the life blood of the firm is mismanaged in relation to changing conditions of the business environment. According to Chand (2005) adequacy of working capital is the life blood and controlling nerve center of every business unit.

In Ghana for instance, most state own enterprises established by the first post independent government became financially distressed and failed to survive due to political reasons, unstable economic environment and financial mismanagement as well as inability of then management to perceive a change in the business environment at that time (Brafo-Insaidoo, Annim and Obeng 2008,p.107). In the contemporary globalization era, the ability of management to effectively manipulate working capital is one of the most important agendas to avoid financial distress when competing in the emerging global market, where information is paramount in making sense of the market directions and financial decisions are made to overcome financial distress. Many authors have attempted to address the issue of financial distress through discussions and formulation of qualitative and quantitative models by focusing mainly on internal conditions of the distressed firms (Malik, Ted & Baptist .2006).

It is becoming more and more apparent that internal sophisticated financial models alone are not the ultimate to help managers and academicians with a more vigorous explanation of financial distress and Working Capital management (WCM).Therefore gregarious analysis of the external and the

internal determinants of working capital in the organizational contexts and their effect on financial distress are undeniably essential for improving organizational financial performance. It is suggested that managers who tend to invest free cash flow of working capital in new projects because they are motivated to lead their companies usually grow beyond optimal size, (Pandy,2005,p.42). This is supported by Duran (2011) who stated that WCM involves the overall range of business processes, such that decisions made regarding working capital components should be synchronized in order to maximize organizational performance (p.37).

Efficient management of working capital triggers company growth and increases the influence of managers by maximising the use of resources under their control, which is also associated with increased manager compensation, commonly linked to sales. Kesimli and Suleyman (2011) opined that Companies which manage their working capital optimally during times of economic recessions come out stronger after the recession period. During times of boom cycles it is easy to forecast working capital needs and manage liquidity. The real test however comes during recession cycles as witnessed by the world economic crisis during 2008 and 2009. Notwithstanding, the volume of working capital should not be in excess than the actual requirements. "Inadequate working Capital is disastrous; whereas redundant working capital is a Criminal Waste" (Chand, 2013:34). Both situations are not warranted in any sound organizations. Therefore, manufacturing firms are required to maintain adequate working capital to meet their targets in the face of unstable microeconomic factors such as inflation, interest rate, exchange rate and income levels.

Statement of the Problem

Failures of large joint stock companies in the U.S.A, Europe and for that matter Ghana over the recent decade such as Philipp Holzmann, Enron, Swissair, Supper Paper Company Limited in Ghana and Ghana Airways and subsequent restructuring of some of the distressed firms such as Anglogold Ashanti in 2014 have sent a signal to most investors across the world that nowadays, not only small and medium enterprises, but also large corporations are not immune to financial distress and corporate failures. Failures and restructurings of many firms are mostly attributed to general managerial ineptitude and specifically, financial distress that arise from maladministration of working capital (Ross, Jaffe & Westfield 2010, p. 953). The causes of financial distress and bankruptcy can be varied (systematic or unsystematic) when taking into consideration the instability, vulnerability, and ultimately the deep-rooted structural change taking place in the global economy.

Global Economic Crisis has forced many companies into cash flow problems, due to non- availability of cheaper credit and working capital, which in turn have led to shrinkage of operations, and postponement of plans for capital expansion into different markets. However, before any corporation fails, such firm's financial health is frequently in distress. Hence, the method of managing corporate working capital and its effect on financial distress is clearly a matter of considerable interest to employees, investors, creditors and other stakeholders. That is financial distress may lead a firm to default on a contract, and it may involve financial restructuring between the firm, its creditors, and its equity investors, (Lubermir, 2002:36). Working Capital Management which is an aspect of financial management is a major concern

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to corporate executives since the inception of concept of finance started evolving, because every business whether big, medium or small, needs finance (working capital) to carry on its operations in order to achieve its targets and survive. Today, many companies are still facing the problem of cash shortage which   has led some companies into illiquidity and financial distress especially after the global economic crisis. This is usually attributed to poor management of the working capital which result in cash flow problems highlighted by an organization exceeding its agreed overdraft limit, failing to pay suppliers on time, and being unable to claim discounts for prompt payment. In the long run, a business with insufficient working capital will be unable to meet its current obligations and will be forced to cease trading even if it remains profitable on paper (Ansah, 2011: 18). Usually the firm is forced to take actions that it would not have taken if it had sufficient cash flow (Ross, Jaffe & Westfield, 2010, p. 953).

The mismanagement of working capital in most firms especially the manufacturing sector arose as result of poor managerial practices, structural problems and economic uncertainties. The World Bank (2006,p.16) in the report of survey of investment climate in Ghana, ranked constraints in the manufacturing sector as follows: Electricity 80%, Access to finance 41% , Transportation 38% , Multiple Taxes 25%, Crime 24%, Corruption 22%, and Others 22%. The survey further stated that capacity utilization rate in the manufacturing sector in Ghana is between 20 and 30 percent indicating gross under utilisation of resources due to a number of factors which include those that have been identified by the World Bank report (2006) such as the high cost of production drawn largely to poor performing infrastructural facilities;

high inflation rate as well as unfavorable exchange rate policies in Ghana**.** Insaidoo, Annim and Obeng (2008: 107) also identified the major constraints of the manufacturing sector to include inadequate finance for working capital, the large depreciation of the cedi, low investment which has made it difficult for manufacturing firms to acquire modern facilities, inadequate information technology and human resources development which are critical in reducing production costs, rising cost of production and increased competitiveness. The low investments have been attributed largely to banks' unwillingness to make credit available to the manufacturers as a result of their perception that manufacturing in the Ghanaian environment is a risky venture. Marfo-Yiadom (2002), opined that many small scale industries do not keep proper accounting records on their operations. Thus, in the absence of proper accounting records and information, the small scale manufacturing enterprises in Ghana face the problem of differentiating clearly between their working capital and profit. Due to this problem, many of such enterprises tend to collapse few years after they have been established or at best, perform poorly in subsequent years.

Therefore managers in the manufacturing firms must try to distinguish clearly between profit and working capital to avoid cash shortages and maintain adequate working capital which is the life blood and controlling nerve centre of a business unit, (Chand, 2013). Hence, the main problem that this study addresses is to examine how working capital mismanagement can result in financial distress and consequently lead to corporate failure. To gain empirical insight into this problem, there is a need to conduct an investigation into the working capital management determinants of listed manufacturing enterprises in Ghana and find out how these external and the internal

determinants of working capital influence corporate financial distress of small and medium scale manufacturing enterprises in Ghana.

Objectives of the Study

The general objective of this study is to assess the relationship betweenworking capital determinants and financial distress level of typical manufacturing companies in Ghana. Specifically, the study intends to achieve the following objectives:

1. Measure the Financial Distress level of the listed manufacturing firms in Ghana.

2. Establish relationship between the internal determinants of working capital and financial distress level of manufacturing firms in Ghana

3. Analyse the relationship between the external determinants of working capital and financial distress level of manufacturing companies in Ghana.

4. Evaluate how changes in the working capital components affect Financial Distress level of the listed manufacturing companies Ghana.

Research Questions

In order to achieve the above objectives the following research questions have been posed for the study

1. What are the working capital determinants that can be used to measure the financial distress level of the listed manufacturing firms in Ghana?

2. What is the relationship between the internal determinants of Working Capital and financial distress level of manufacturing firms in Ghana?

3. What is the relationship between the external determinants of working capital and corporate financial distress level?

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4. How will changes in working capital component influence the financial distress level of manufacturing firms in Ghana?

Hypotheses for the Study

To answer the above research questions the study made the following hypotheses that:

H1: Measuring financial distress level of listed manufacturing firms has no correlation with the working capital determinants.

H2: The internal determinants of Working Capital have no significant relationship with the financial distress level of listed manufacturing companies in Ghana.

H3: The external determinants of Working Capital have no significance relationship with financial distress level of listed manufacturing companies in Ghana.

H4: Change in net working capital components have no significant relationship with the financial distress level of listed manufacturing firms in Ghana.

Significance of the Study

Working capital management which is the theme of this research is important because it directly affects the liquidity, profitability and growth of a business enterprisesLamberson, (1995). According to Ross, Westfield and Jaffe (2005) there often exists a disparity between cash inflows and cash outflows during operating activities. To control these cash flows and thereby moderate the potential negative effects on profitability and risk, it is important that working capital management is applied within firms to improve its value. Working capital management is an important subject to financial managers

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who dedicate significant amounts of time and effort seeking an ideal balance between risk and return, profitability and liquidity, in order to create value for the company so as to avoid financial distress Appuhami, (2008).The importance of this research is to assist financial managers in both public and private enterprises to look beyond the internal factors that affect working capital management and take holistic approach in addressing financial issues.

Scope of the Study

There are several decisions that corporate executives undertake to enhance financial performance. Some of them include: capital budgeting decisions, mergers and acquisition decisions, capital rationing decisions and short term financing decisions. This study focus on working capital management which is the variant of short term financing decisions usually made by managers of business enterprise. That is what takes place daily in organization eventually determines the kind of long term decisions to be made in the long run. Also this study is limited to listed manufacturing companies in Ghana only, because the researcher's aim is to use published financial reports of the listed firms to find out how manufacturing companies in Ghana manage their working capital during the period of economic crisis as well as in the boom cycles to improve financial performance.

Limitation of the Study

Apart from time and financial constraints that are common to many research work, this study modified some of the existing financial models such as Melton (1968) Ohson (1980) and Altman (2005) financial distress models to suit only Ghanaian economy. This presupposes that any attempt to replicate this study in different countries will require further modifications. The

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Profound differences between regions and countries in accounting rules, legal environment and business practices among others may limit the degree of convergence in the area of working capital management and financial distress. Furthermore there are number of behavioural factors such as managerial practice, employee competence, political situations and orgnisational structure that influence working capital management and financial distress level but could not be quantified and did not feature in the financial model of this research. Also, the study is limited to manufacturing sector of the Ghanaian economy only to the neglect of other equally relevant sectors due to space and time. In addition, the working capital management concepts are for short term financing decision making only. Therefore to address these limitations an error term was introduced in the financial model to minimize the impact of such discrepancies.

Organization of the Study

Generally, the study is organized into five chapters as follows: introduction, review of related literature and methodology chapters. Other two chapters include discussion of result as well as findings, summary, conclusion and recommendations.

Chapter one is devoted to the background of the study, statement of the problem, objective of the study and research questions which were formulated out the objectives. Other issues discussed in chapter one include; justification of the study, scope of the study, limitations and organization of the study.

Chapter two deal with the review of related literature on the subject matter of the study. Similar research works on working capital management

were reviewed to set up the theoretical and the empirical framework to suit the topic under study.

In chapter three the researcher discussed the methodology adopted for the study. The research design, population and sampling techniques were discussed. The description of the data collection procedure, instrument and data analysis plan were dealt with. Chapter four is devoted to the analysis and discussing of the findings of the study. Tables and diagrams were used to present and discussed the findings of the study. Chapter five discusses the summary, conclusions and recommendations made from the study. Summary of the findings from the study as well as conclusions and recommendations were presented in this chapter. Suggestions made for further research were also included in this chapter.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

An Overview

This chapter aims to develop an understanding from extant literature about the determinants of Working Capital Management (WCM) and their influence on financial distress level by explaining WCM in particular external and internal environments of manufacturing business organizations in Ghana. This includes exploring the meaning and classification of WCM, examine the theoretical foundation of working capital management and financial distress and discuss the four main agendas in relation to which this research work is grounded. The four agendas include: first, the discussion of how to measure the financial distress level of manufacturing firms in Ghana; second, how changes in the internal determinants of working capital influence the financial distress level;third, how the external determinants of working capital influence financial distress level of manufacturing companies in Ghana; fourth,how a change in working capital component can influence the bankruptcy level of listed manufacturing companies through the review of related literature of WCM. In doing so, the relevant models, concepts and frameworks are developed to serve managerial needs in particular operating environment.

Meaning and Classification of Working Capital:

One of the earliest meanings of working capital was suggested by Mann (1918, p.342), "the amount of money or money equivalent found to be necessary to conduct the current operations of the utility". It is also recognized as net working capital (NWC), the amount of capital required to retain a company in operation or staying liquid. NWC is the reflection of the operating

cycles, financing options and liability commitments. The Committee on Accounting Procedure of the American Institute of Accountants (1947) issued an Accounting Research Bulletin (ARB) no. 30 which defined working capital as: ''Working capital is represented by the excess of current assets over current liabilities and the relatively liquid portion of total enterprise capital which constitutes a margin or buffer for meeting obligations to be incurred and liquidated within the ordinary operating cycle of the business''(Committee on Accounting Procedure, 1947, p. 282).

Accounting Research Bulletin (ABR) number 30 definitions identified the operating cycle for current assets and current liabilities to be twelve months because many transactions fall within this time period. However, it also acknowledged the existence of longer business cycles in certain industries, where companies may use extended periods, for example distilleries, lumber and agriculture. This bulletin was criticized by practitioners for its inconsistency with practices. The review of this bulletin as suggested by Nunn (1981), Hawawini, Viallet and Vora (1986) and Kolay, (1991) opined that two important issues identified during this period are disputes over operating cycles of working capital and specifications of current assets and current liabilities. Also, Marfo-Yiadom (1996) established that nature and size of business, business fluctuation, growth and expansion activities, availability of credit facilities from suppliers, and price level changes influence working capital cycle and decisions greatly.

In the midst of the various factors which influence working capital management of firms which include nature of business, market demand conditions as stated by Ben-Horim and Levy,(1983), factors such as

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Technology and manufacturing policy (Wood, 1993), payable management and credit policy of the firm, (Walia,1977),are regarded as working capital determinants. Many authors like Shin and Soenen (1998) have argued that it is important for firms to shorten the cash conversion cycle (CCC),which is an aspect of working capital cycle as managers can create value for their shareholders by reducing the cycle to a reasonable minimum.

In recent times, Working capital has gone through a lot of transformation such that it simply refers to the firm`s investment in short-term assets (Olufemi et al 2001). Moyer, Mcguigan and Kretlow (2001) revealed that sales level, credit policies and the length of the operating cycle impact working capital decisions and that one of the integral components of the overall corporate strategy is to manage working capital efficiency. As mentioned above, the CCC is used as a comprehensive measure of WCM (Deloof, 2003). This need arises because management have to control short term obligation as well as optimize investment in liquid assets as much as possible in order to create shareholder value (Eljelly 2004).

The Kuhlemeyer, (2004) stated that in a typical manufacturing firm, current assets exceed one-half of total assets. Filbeck and Krueger(2005) opined that, conditions of supply, size, agency problem, growth and profitability are seen as working determinants and that Gitman,(2005) asserted that operating efficiency and competition are factors of working capital management. Working capital is regarded as the difference between the current assets and the current liabilities or in other words as net assets. The identification of such difference is crucial because Padachi (2006) opined that

management of working capital is important in ensuring the financial health of all businesses.

Basis of Classifying Working Capital

According to Vidya (2007), The basis of working capital classification include; quantitative approach, financial report approach and variability approach. The quantitative concept takes into account the total of all current assets while the qualitative concept takes into account the difference between current asset and current liabilities (excess of current assets over current liabilities).

Classification on the Basis of Financial Reports

Under this classification, the information for determining working capital is derived from Balance Sheet and Profit and Loss Account; therefore the working capital may be further classified as follows:

Comprehensive Statement Working Capital:- This is working capital calculated from the information contained in profit and loss account. This concept of working capital has become very important in recent years because it shows the adequacy of cash flow in business and it is based on Operating Cycle Concept.

Financial performance Working Capital-The data for this kind of Working Capital is derived from the balance sheet. On this basis the working capital can also be divided into three main types, namely: Gross Working Capital, Net Working Capital and Deficit Working Capital. Deficit working capital arises where the amount of current liabilities exceeds the amount of current assets(Vidya2007,p.15).

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The types of working capital that can be deduced from the above financial report classification can be summarized as follows:

i.   Gross Working Capital = Total Current Assets.

ii. Net Working Capital = Excess of Current Assets over Current Liabilities

iii. Working Capital Deficit=Excess of Current Liabilities over Current assets.

Classification on the Basis of Variability

Gross Working Capital can be further divided into two categories namely:

i. Seasonal or Temporary or fluctuating working capital.

ii. Fixed or permanent working capital. This type of classification is very important for decisions regarding hedging in financial derivative market.

Temporary Working Capital: Temporary Working Capital is also known as fluctuating or seasonal working capital. It signifies additional investment needed during prosperity and promising economic conditions. It increases with the growth of the business. ''Temporary working capital is the additional current assets required to meet the variations in sales above the permanent level.'' This can be calculated as follows: Temporary Working Capital = Total Current Assets – permanent Current Assets. Permanent Working Capital – It is a part of total current assets which does not changed even if there is variation in sales. There is always a minimum level of cash and cash equivalents, inventories, and accounts receivables which is always maintained in the business even if sales are reduced to the nearest minimum. Amount of such investment is known as permanent working capital. "Permanent Working

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Capital is the amount of working capital that persists over time regardless of fluctuations in sales''. This is also known as regular working capital.

Theoretical Review of Working Capital and Financial Distress

This study relates the theories of capital asset pricing and bankruptcy to working capital management and financial distress as the principal basis of corporate failure as follows:

Capital Asset Pricing theory

The capital asset pricing theory is based on assumption that the expected return on a security is positively related to its beta. That is the higher the risk, the more the returns. Any investor seeking higher returns must be ready to invest his working capital in a risky asset and prepare to do diversification to minimize the risk. This means that the relevant risk in large and well-diversified portfolios is all systematic because unsystematic risk is diversified away (Ross, Jaffe & Westfield, 2010). This implies that when a well-diversified shareholder considers changing her holdings of a particular stock, she can ignore the security's unsystematic risk. However, it has been confirmed by empirical results from Kaplan and Stein (1993); Asquith, Gertner & Scharfstein (1994); Theodossiou, Kayha, Saidi and Philipatos (1996); Andrade and Kaplan, (1997); and Whitaker, (1999), that financial distress arises in many cases from endogenous systematic and unsystematic risk factors, such as mismanagement of working capital, high leverage, and a non-efficient operating structure in place. The relationship between working capital determinants and financial distress is, according to capital market theory, of unsystematic nature.

In addition to that, Lubomír (2002) stated that the emissions of so-called junk bonds or high yield bonds seem to be right thing to do where the debtor search for the required working capital in order to implement the improvement strategy and promises high yields to the investors in case of success. Notwithstanding, individuals and institutional investors in manufacturing firms believe that the unsystematic nature of the default risk of scrap bonds can substantially improve the performance of their well-diversified portfolios. However, Kalckreuth (2006), Garlappi, Shu and Yan (2006) relate the capital asset mispricing anomaly to the shareholders' bargaining power in default. The shareholders' bargaining power is attributed to "ability of shareholders to extract rents in renegotiation with other claim-holders in the event of financial distress".

Garlappi, Shu and Yan (2006), set-up a model based on the option pricing theory with equity as a call option on the firm's asset value and non-zero payoffs to the shareholders upon default (absolute priority rule deviations). Default is seen as a cause of liquidation. Since liquidation is usually only a choice of last resort which leaves the shareholders with nothing as many firms in financial distress will try to renegotiate their debt and take advantage of the bargaining game in private workouts. In fact, the shareholder advantage is not a new asset pricing issue: it identifies different cash-flow realizations in capital asset pricing process.

Bankruptcy theory

The underlying factor of the theory of bankruptcy is the concept of capital structure which is the debt/equity mix of the firm's capital. When planning the debt and equity capital, the finance manager must take into

account of the attitude to risk of existing and potential investors. A firm with large proportion of debt in its capital structure is said to be highly geared. Usually firms with inadequate working capital borrow to vary the capital structure in order to escape financial distress and survive. A company which is highly geared is in risky business and near to bankruptcy, (Pandy2005, p.44).

According toRoss, Jaffe and Westfield,(2010).''Chapter 7of the Bankruptcy Reform Act of 1978 deals with "straight" liquidation and the following sequence of events is followed when firm become financially distressed:

1. A petition is filed in a High court. A corporation may file a voluntary petition, or involuntary petitions may be filed against the corporation;

2. A bankruptcy trustee is elected by the creditors to take over the assets of the debtor corporation. The trustee will attempt to liquidate the assets;

3. When the assets are liquidated, after payment of the costs of administration, proceeds are distributed among the creditors.

4. If any assets remain after expenses and payments to creditors, they are distributed to the shareholders''.

Evidence from prior study from White (1996) points to ex-ante financial distress costs as the most significant source of bankruptcy costs. However, Ward and Foster (1997) opined that studying only bankruptcy leads to a fundamental bias because firms usually get into a financial distress cycle and a lack of financial flexibility in working capital management several years before filing for bankruptcy. Pindado and Rodrigues (2004) furthermore indicate that bankruptcy is only one of the possible outcomes of financial

distress, which is mainly of a legal nature, without any specific economic and univocal significance. Therefore Lubomír (2002) stated that firms that mismanage their working capital see bankruptcy in three competing ways as the principal cause of the financial distress as follows:

1. Neoclassical approach. Here, the bankruptcy is seen as a good thing since it frees poorly allocated resources. This is a "restructuring" case when the bankrupt firm has the wrong mixture of assets and file for bankruptcy;

2. Financial approach. The bankrupt firm has the right mixture of assets but a wrong financial structure; and therefore undertake financial restructuring.

3. Corporate governance approach. In this case, the bankrupt firm has the right mixture of assets and financial structure but is poorly managed.

In this case bankruptcy is an ineffective way of resolving the problem of corporate failure. More effective way is to fire the management. While corporate governance does not receive much support in ownership structure, it is well supported by the indicator of planned privatization, which can be interpreted in certain setups as a different measure of the corporate governance structure. When fully monitoring for the structure of liabilities, the firms from planned privatization are less likely to go bankrupt. This can be inferred as an indication of a lenient budget constraint.

The increased probability of bankruptcy usually occurs within financial year which involves complex process known as the working capital cycle. In this cycle, managements of firms are expected to efficiently turn human and material resources into cash (known as cash conversion cycle) and into other potential benefits in order to avoid financial distress and subsequent

bankruptcy. The revolving nature of working cycle is illustrated in the Figure 1 below:
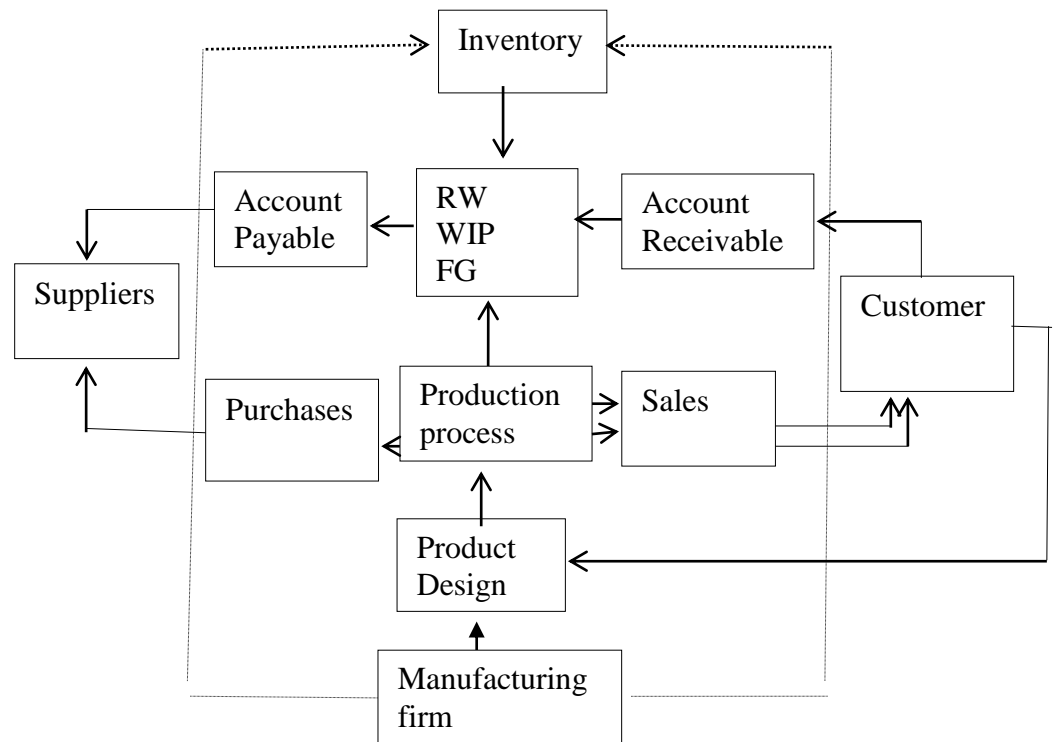
Figure 1: The Working Capital Cycle   Source: www.interest.co.nz/site

The working capital cycle represents the time difference between the acquisition of raw materials and other inputs, and the receiving of cash from the sale of the finished goods. The Cash Conversion Cycle (CCC) is a part of this working capital cycle. The CCC is the time lag between the paying of the raw materials and the receipt of money from the sale of goods. In other words, the period between the acquiring of raw materials and the paying of these materials plus the cash conversion cycle forms the working capital cycle of a firm. The cash conversion cycle is measured using the following formula: Cash Conversion Cycle = the number of days of inventories plus the number of days accounts receivables minus the number of days accounts payables.

In addition, current assets in this case are cash and other resources such as short-term investments (government and marketable securities), receivables,

inventories and pre-paid expenses that companies reasonably expect to convert to cash or use up within one-year or less takes place within the cycle(Kimmel, Weygandt, &Kieso, 2007). The Empirical Importance of Working Capital Cycle to Finance Officers, according to Abdulai (2007) is that the concept of working capital cycle is very important for the following reasons: (i) Avoidance of overtrading (ii) Determination of working capital required to finance a particular business operation at a time (iii) Determine the length of time it takes to do the cash conversion and that the longer the cash conversion cycle, the greater the need for liquidity. The number of days accounts receivables; inventories and accounts payables which are used as the operationalization of the management of trade credit and inventory can be identified in the cycle which helps to measure financial distress level of the firms.

Measuring Corporate Financial Distress: The A-Score Model

According to Ross, Jaffe and Westerfield (2010) financial distress is a situation where a firm's operating cash flows are not sufficient to satisfy current obligations (such as trade credits or interest expenses) and the firm is forced to take corrective action.Financial distress may lead a firm to default on a contract, and it may involve financial restructuring between the firm, its creditors, and its equity investors. Usually the firm is forced to take actions that it would not have taken if it had sufficient cash flow.

Symptoms of Corporate Financial Distress

The list of events that herald corporate financial distress is almost endless, but here are some examples: Dividend reductions, Plant closings, Losses, Layoffs, CEO resignations and Plummeting stock prices.

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Models of Financial Distress

To measure the level of financial distress many authors have expressed their concerns through sophisticated financial models. These models are usually categorized into accounting based and market based models.

Accounting-Based Models

Altman,(1993) deduced, accounting-based models that test the usefulness of information contained in the financial statements of a company to provide an adequate assessment of the financial distress risk. These techniques are based on a number of financial ratios or some ratios which are computed and compared to a benchmark for this ratio or weighted combination of the ratios in order to allocate the firm to one of two groups: sound or financially-distressed. Since distress risk in traditional accounting models is measured by a dichotomous variable which classifies a company as sound or financially distressed with respect to a specified cutoff, this class of models is also known as binary or dichotomous models. Financial data used in the accounting-based models to predict financial distress, such as profitability, liquidity, and solvency ratios, are measured ex-post.

Market-Based Models

Although accounting-based models are still widely used in empirical research, they have serious limitations, especially when utilized explicitly for measuring distress risk. These obstacles are overcome in market-based models which attempt to estimate the distress risk by means of a combination of the firm's liability structure with market prices of its assets. The fundamental assumption of market-based models is that market values contain all information relevant to the providers of capital for computing the probability

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of default. The first market-based model was introduced in 1974 by Merton. Since the commercial introduction of structural models and Credit Metrics in the 1990s and the development of reduced models in the early 2000s, market-based models have become very popular among investors.

Platt and Platt (2006) adopted a multidimensional explanation of financial distress in which they denoted a firm as financially distressed only when it meets three of the conditions noted below. These three measures are:

1. Negative EBITDA to interest coverage (as cited in Asquith, Gertner and Scharfstein (1994)).

2. Negative EBIT (as cited in John, Lang, and Netter (1992)).

3. Negative net income before special items (as stated by Hofer (1980)).

To be included as financially distressed a company needed to fail all three tests in two consecutive years. Companies classified as not financially distressed did not meet any of the three criteria in the two consecutive years. Interestingly, the negative EBITDA to interest coverage and the negative EBIT measures are less correlated than one might expect.

In addition, Altman and Hotchkiss (2005),used economic criteria to define failure as a situation when "the realized rate of return on invested capital, with allowance for risk consideration, is significantly and continually lower than prevailing rates on similar investments". Failure as a part of the distress cycle comprises the information about the fact that continuously diminishing profitability and a company performance lower than the industrial average are not temporarily but permanent. The financial ratios of the company in this case reflect revenues inadequacy to cover costs, and the average return on investment (ROI) falls far below the cost of capital. Failure shows the

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movement of the firm from a viable, "endurable" level of decline to the marginal level. Operational decline leads to the cash buffer more and thinner and experience cash shortages.

Altman's and Ohson's Financial Distress Models

Many potential investors use credit scoring models to assess the creditworthiness and longevity of prospective firm of their interest. The general idea is to find factors that enable the investors or lenders to discriminate between good and bad credit risks. To put it more precisely, lenders of funds want to identify characteristics of the borrower that can be used to envisage default or bankruptcy. Altman(1993) a professor at New York University, has developed a model using financial statement ratios and multiple discriminants analyses to predict and measure bankruptcy levels for publicly traded manufacturing firms. The resultant model is expressed as follows:

$$Z= 3.3 \frac{\text{EBIT}}{\text{Total Asset}} + 1.2 \frac{\text{Net working capital}}{\text{Total Asset}} + 1.0 \frac{\text{Sales}}{\text{Total Asset}} +$$

$$.6 \frac{\text{Market Value of equity}}{\text{...Book value of debt}} + 1.4 \frac{\text{Accomulated Retained earnings}}{\text{Total Asset}}$$

where Z is an index of bankruptcy.

A score of Z less than 2.675 indicates that a firm has a 95 percent chance of becoming bankrupt within one year. However, Altman's results show that in practice scores between 1.81 and 2.99 should be thought of as a gray area. In actual use, bankruptcy would be predicted if $Z \leq 1.81$ and non-bankruptcy if $Z \geq 2.99$. Altman demonstrations that bankrupt firms and non-bankrupt firms have very different financial profiles within one year before bankruptcy. These different financial ratios are the key intuition behind the Z-score model.

Another author called Ohlson (1980) critically assessed the restrictive assumptions of multiple discriminant analysis deduced by Altman in 1968 and concluded that the output of the Altman's technique has no single dichotomous score which, in fact, says nothing about the probability of default. In order to mitigate these problems, Ohlson introduces an alternative econometric technique based on the logistic transformations (Logit model). Comparable to the discriminant analysis, this technique weights the independent variables and assigns a score (called the O-score). Unlike the discriminant analysis, Ohlson's method estimates the probabilities of default for each company in a sample.The logit approach incorporates non-linear effects and uses the logistic cumulative distribution function to maximize the joint probability of default for the distressed firms and the probability of non-failure for the healthy companies in the sample as follows:

$$f(\text{Z}) = \frac{1}{1+e^{-z}} = \frac{1}{1+e^{-(\omega 0 + w1X1 + \cdots + WnXn}}$$

Where Z is a linear combination of the independent variables, $w0$ is a constant, wi represents coefficients, and xi is independent variables. The method of maximum likelihood is then applied to estimate the coefficients. However, the logistic cumulative function by Ohlson used only one external variable (General price level index) as the only microeconomic variable that has influence on financial distress level of the firms he studied.Finally, for the estimation of the coefficients and the calculation of the O-Score predicting default within one year, nine independent variables were employed and two of them were dummy variables.

For the purpose of this study both Altman's and Ohlson'sfinancial distress models were modified to suit the economic circumstances of Ghanaian firms.

The Modified Financial Distress Model

Based on the above models, the modified financial distress model to be used for analysis in this research is as follows:

$$fds=[1.79 \frac{EBIT}{Total\ Asset} + 0.29 \frac{Net\ working\ capital}{Total\ Asset} + 0.01 \frac{Sales}{Total\ Asset} +$$

$$0.27 \frac{Market\ Value\ of\ equity}{Book\ value\ of\ debt} + 1.39 \frac{Accomulated\ Retained\ earnings}{Total\ Asset} -$$

$$0.03 \frac{Current\ Asset}{Current\ Liability}]/[log\left[\frac{(-0.32*GDP-0.3*EXR-1.79*INFL+2.97*INTR+2.40*MKVE)}{5}\right]]$$

See the Research Methodology Section of how and why this Model was deduced

Strategies to Deal with Corporate financial Distress

Firms deal with financial distress in several ways, such as these:

1. Selling major assets. 2. Merging with another firm. 3. Reducing capital spending and research and development. 4. Issuing new securities.

5. Negotiating with banks and other creditors. 6. Exchanging debt for equity.

7.Filing for bankruptcy. Items (1), (2), and (3) concern the firm's assets. Items (4), (5), (6), and (7) involve the right side of the firm's balance sheet and are examples of financial restructuring, (Ross, Jaffe & Westfield, 2010). Financial distress may involve both asset restructuring and financial restructuring i.e., changes on both sides of the balance sheet. (Ross, Jaffe & Westfield, 2010).

In order to deal with the relationship between working capital and financial distress levels of the selected firms the following issues worth discussing:

The relationship between the internal determinants of Working Capital and financial distress levels of manufacturing firms in Ghana.

The Internal determinants of working capital are variables inside the organization that have impact on the financial distress level of the business organization.The Internal Working Capital Determinants include: GROWTH (change in sales), PROFITABILITY [(return on asset (ROA)], LIQUIDITY [(cash conversion cycle (CCC) and current ratio (CRT)], SIZE(log of total asset), LEV(log of debt/asset), Cost of Sales(COSALES) and other internal qualitative determinants as classified and discussed below.The essence of classifying and managing these determinants is to enable finance managers to distinguish between profit and working capital so as to invest excess working capital prudently in order to avoid financial distress.

Classification of Internal Determinants of Working Capital

The Internal determinants of working capital are variables inside the organization that impact positively or negatively on the financial performance of the business organization. Srisvastava (2004) identified eleven internal factors that are considered to affect WCM: Managerial practice, working capital policy, performance measurement systems, information technology, employees' behaviour, investment policy, production and supply chain management, payables management, credit policy, and employees' financial knowledge. The review suggests that these factors seem to affect an organization as a whole, but certain factors may specifically impact WCM components. For example, implementation of a performance management and measurement system which is aimed at strategically improving the overall organizational performance and involves participation of all members of the

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organization will definitely affect the components of working capital management.

Alternatively, changes in working capital policy would specifically affect WCM performance. For example, a receivables policy that specifies terms and conditions in approving credit applications and cash collection activities and an inventory handling policy specifies how materials should be maintained and organized. If a company intends to shorten the cash conversion cycle, managers may 'squeeze' elements of working capital policy to conserve cash, a move likely to influence working capital performance. These examples indicate how certain internal factors are most likely to affect WCM, while others affect the organization as a whole. The Internal factors as identified by CFA institute (2013) are company size, growth rates, organizational structure, and sophistication of cash convention cycle, borrowing and investing positions/activities/capacities.These factors are some of the internal determinants that influence working capital management. In effect internal determinants of working capital can be either qualitative or quantitative.

The Qualitative and Quantitative Internal Determinants of Working Capital

The qualitative determinants involve managing behavioural factors as well as measurable factors that affect Working capital management and their relationship with financial distress levels.

Managing Internal Qualitative Determinants of Working Capital

Internal qualitative determinants are variables that influence working capital but cannot be measured in numerical terms. They include: employees' behaviour, investment policy, employees' financial Knowledge, production

and supply chain management, Organizational structure, board characteristics, implementation of a performance management and measurement system which is aimed to strategically improve overall organizational performance. These are qualitative factors that directly or indirectly influence working capital management in business organization.

Employees' Behaviour

The employees' behaviour is influence by two main variables such as employee relationship and employee development. These variables are explained as follows; Employee Relationship assumes that companies actively seek good employees who have committed relations with organizational environment. Finance manager should know the employee needs and expectations and takes decision with regards to welfare programme for the employees of the companies. Accoording toDuran (2011) by seeking the needs and meeting the expectations of employees and intertwines them with commensurate welfare programmes, the employee's relationship can be improved in the organization which eventually affects the business performance including finances.Employee Development refers to the existing employees who are the asset of the organization that require training. For long term purposes, the company's employees will need training for further course of action that effectively and efficiently managed to produce productivity in the competitive position and market. Therefore, it is one of the major long-term objectives of the organisation. The cost of training these employees has a direct effect on firm's finance and productivity.

Employees' Financial Knowledge

The employee groups tended to press on the organisation to be meeting their expectations, needs and demands and for upholding their value and interests in the organisation's resources. These needs are partially if not totally met with finance. Therefore employees' knowledge and ability to determine the financial viability of the organization is very important. Ability of finance manager as an employee to raise short term and long-term capital: either debt or equity, maintain good corporate level resource, know the cost of capital relative to industry and competitors is very essential. Furthermore, the knowledge of tax considerations, build up effective relationship with owners, investors, financial institution and stock holders as well as capacity utilization of financial strategies, like lease or sale and lease back influence the firm's financial performance. In addition the understanding of the cost of entry and barriers of the entry, the price earnings ratio, Present working capital position of the organisation. Effective cost control and ability to minimize cost of expenditure for production of goods and services have multiple influence on the firm's financial performance.

Production and Supply Chain Management

Supplier is the important force of the micro/operating environment of an organization or company i.e, the suppliers are those who supply the inputs like raw materials and components to the organisation. Accurate forecasts are an integral part of effective product, facility, process, and production planning (Lee, 1986). Hogarth and Makridakis (1981) stated that, forecasting is encouraging for short-term planning. They suggest that in short-term forecasting (three months or less), there is considerable inertia in most

economic and natural phenomena. For this reason, simple mechanistic time series forecasting can be expected to perform well and improve planning efforts. Therefore, the effectiveness of either Marginal Rate of Production (MRP) or Just InTime (JIT) control systems depends largely on the ability of the production and operational manager to forecast accurately. The important and reliable source / sources of supply to the smooth function of a business is very important because uncertainties are generated when the several supply problems like maintenance of inventory, delay of supply of inventory to organization become frequent.

Many organisations give high importance to vendor development, vertical integration in order to solve the supply problem. Organisations which have depended on a single supplier are at risk due to factors such as strike, lockout or any other production problem of the supplier. According to Sconberger (1984), since many of the problems associated with production are quality related, each time a problem is solved quality is improved and therefore improving productivity and maximizing profits. Always an organisations depend on several suppliers of the same raw material. Similarly, a change in attitude or behavior of the suppler may also affect the organisation. Hence, multiple sources of supply often help reduce such risks. The supply management assumes more importance in a scarcity environment.

Organizational Structure

This study opined that structural designs influence managerial approaches to WCM, particularly WCM decision making processes and information linkage. This is consistent with organizational scholars such as (Chenhall, 2003;Lawrence &Lorsch, 1967; Miles & Snow, 1978) who have suggested

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that structural designs influence decision making authorities and information sharing arrangements.Hence, it is necessary for a company to implement an appropriate structural design to suit its environment (Daft, 2004; Miles & Snow, 2003).Smith and Sell (1980) found that overall management of working capital components of American companies were more centralized, meaning the decision making authority was given more to top management, in 1978.

Later, in the mid1980s, the American companies gradually decentralized the management of working capital components. Additionally, Gitman and Maxwell (1985) found that Fortune 1000 companies decentralized receivables and payables management but centralized financial planning and budgeting. This phenomenon has changed over time, and management of working capital became more decentralized in 1988 due to the large size and business scope of American corporations (Belt & Smith, 1991).Thus how quickly financial decisions are made affect working capital cycle and financial distress levels.

Board Characteristics

Moussawi (2006) found significant relationships between the board characteristics and working capital investment. However in a study by Zariyawati (2010) found insignificant relationships between these two variables and working capital for the Malaysian case. The large and less independent boards were found to have higher net operating working capital. An insignificant relationship could mean that working capital management issues may not be of importance to Board of Directors and so decisions made by Board of Directors do not influence the working capital investment of their firms. Notwithstanding, when board of directors approve budget for the year

on time it enables management to allocate working capital for efficient running of the firm.

Performance Management and Measurement System

Management efficiency is one of the key internal factors that determine the firm's profitability. It is represented by different financial ratios like total asset growth, loan growth rate and earnings growth rate. Yet, it is one of the complex subjects to capture with financial ratios. Moreover, operational efficiency in managing the operating expenses is another dimension for management quality. The performance of management is often expressed qualitatively through subjective evaluation of management systems, organizational discipline, control systems, quality of staff, and others. Yet, some financial ratios of the financial statements act as a proxy for management efficiency.

The capability of the management to deploy its resources efficiently, income maximization, reducing operating costs can be measured by financial ratios. One of these ratios used to measure management quality is operating profit to income ratio (Rahman et al. in Ilhomovich, 2009; Sangmi and Nazir, 2010). The higher the operating profits to total income (revenue) the more the efficient management is in terms of operational efficiency and income generation. The other important ratio is that proxy management quality is expense to asset ratio. According to Tirole (2005), monitoring systems include a variety of instruments such as board composition, auditors, large shareholders, large creditors, investment banks, etc. Deciding the way to invest internal funds is central in shareholders and managers conflicting interests According to Easterbrook (1984), when managers have a substantial

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part of their capital or wealth allocated in shares of the company, they tend to take decisions to enhance its probability and survival. These decisions can lead to a conservative management of working capital by reducing the risk involved in the operation of the business, e.g., by keeping high levels of inventory beyond process cycle necessities, offering credit terms above product turnover, accepting low payment terms that are not aligned to market practices, etc. In this case, these investment decisions would translate into an excess of working capital.

Therefore, the second hypothesis of this study aims to investigate whether companies under monitoring mechanisms of managers have lower levels of working capital requirement and prone to financial distress. According to Jensen (1986), managers with substantial free cash flow tend to feel encouraged to engage the company in unnecessary expenses. He defined free cash flow as the excess of cash flow beyond the necessary to fund all projects with positive net present values, when discounted at the relevant cost of capital. In organizations with low level of monitoring or discipline over management actions, a high level of free cash flow may encourage managers to follow their own interests and undertake negative present value capital projects rather than return cash to equity holders (McMahon, 2006).

Budgetary Control

This study proposes that managers should better understand the appropriate use of budget and control to effectively manage WCM components. The extent to which managers rely on budget to control subordinates signifies different managerial approaches (Hopwood,1972; Sulaiman, 2004). In an organization where financial measures are inadequate

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to facilitate decisions, managers may consider various factors (similar to ongoing planning), in which they are also considering subjective performance measures when making decisions(Van der Stede, et al., 2006). In contrast, other managers would rely solely on budget to control subordinates to achieve intended financial targets (Sulaiman 2004; Waterhouse &Tiessen, (1978).

Managing Internal Quantitative Determinants of Working Capital

Company size, growth rates, sophistication of cash convention cycle, borrowing and investing positions/activities/capacities are some of the internal determinants of working capital that can be measured in numerical terms. A receivables policy that specifies terms and conditions in approving credit applications, cash collection activities, an inventory handling policy which specifies how much materials should be maintained and organized as well as the rate at which the firm pays its creditors are some of the quantifiable determinants that influence working capital.

Company Size

Berger and Udell, (1998) and Jordan, Lowe and Taylor, (1998) have argued that the cost of investment in working capital would be lower for larger firms compared to smaller ones since larger corporations have lower information asymmetry and thus lower cost of external financing. Moreover, larger firms have better access to capital markets and have larger capacity to extend more trade credits that enable them to have more investment in working capital as compared to smaller firms (Niskanen&Niskanen, 2006; Petersen &Rajan, 1997). I use natural logarithm of total assets as a proxy for firm size.

Firm Growth Rates

The effect of growth opportunities on working capital can be done via trade credit grant or investment in inventories. Anticipation of the future sales growth might cause to increase the amount of investments in inventories. I use the ratio of sales growth as a proxy for firm growth as used by Gill (2011), Zariyawati, Annuar, Abdul, (2009) and Caballero, Teruel, and Solano,(2009). Sales growth affects trade credit granted and received, as well as investment in inventories (Nunn, 1981). According to Chiou, Cheng & Wu (2006) Firms with fast growing sales pay more attention to WCM and that there is a negative but not significant relationship between growth and working capital requirements. Furthermore, Nakamura and Palombini (2009), found negative relationship between growth and cash conversion cycle. For García-Teruel and Martínez-Solano, (2010) growth is negatively related to accounts receivable and positively with accounts payable for small firms. On the other hand, Kieschnick, Laplante and Moussawi (2006) showed a positive relation with firm's WCM suggesting that firms build up inventories anticipating future sales growth.

The Cash Convention Cycle

The net operating cycle (or the cash conversion cycle)is the length of time it takes for a company's investment in inventory to generate cash, considering that some or all of the inventories are purchased using credit. The length of the company's operating and cash conversion cycles is a factor that determines how much cash and cash equivalence a company needs.

Current assets include cash, accounts receivable, marketable securities, inventory, and prepaid expenses such as taxes and insurance. These are the

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assets that can be converted into cash in the near future, usually less than one year. The operating cycle is the length of time it takes a company's investment in inventory to be collected in cash from customers. In addition, Caballero, Teruel and Solano (2009), piloted a study to determine working capital management in small & medium- size Spanish corporations (SMEs). The panel of 4076 SMEs firms over the period from 2001 to 2005 were selected and Cash Conversion Cycle (CCC) was used as a complete proxy for the effectiveness of working capital management. Panel data analysis, including OLS regression and fixed effect model applied. Their finding pointed out that firms with longer cash conversion cycle are older firms with more cash flows and that debt ratio, operation cash flow to total assets, firms' age and return on assets were negatively and positively related to the working capital requirement.

This is consistent with Marfo-Yiadom and Agyei (2011) of which the results of the study showed strongly that debtors' collection period, creditors' payment period and cash conversion cycle are the key factors which explain the level of working capital held by banks in Ghana. In addition firm size, capital structure, profitability and firm's age are significant in explaining amount of cash holding. Specifically, the results show that while debtors' collection period, cash conversion cycle, capital structure, firm size have significantly negative relationship with the working capital position of firms, creditors payment period and profitability have positive relationship with the working capital cycle position of banks in Ghana.

Managing Cash and Cash-equivalents

The first kind of current asset that is most liquid is cash or cash equivalents. Cash acts as a buffer for a company to finance its operations in a manner that is suitable for the nature of its business operating cycle (Boisjoly&Izzo, 2009; Emery, 2004; Gitman, 2009). The difficulty in cash management is to balance the appropriate level of cash and marketable securities that reduce the risk of insufficient working capital for operations with the opportunity cost of holding excessively high levels of these resources.

Firms determine their cash management strategies based on two main objectives: 1) Financing by doing firms payments, 2) Minimizing the cash that remain stagnant in the firm (Nov & Remound, 2001). Cash equivalents include negotiable items such as commercial paper, money market funds, and treasury bills. Others are marketable securities, which are short-term investments that can easily be transitioned to cash. Management of the cash position of a company has a goal of maintaining positive cash balances throughout the day. Forecasting short-term cash flows is difficult because of outside, unpredictable effects (e.g., the general economic conditions). Companies tend to maintain a minimum balance of cash (a target cash balance) to protect against a negative cash balance. Managers use cash forecasting systems to estimate the flow (amount and timing) of receipts and disbursements. Managers monitor cash uses and levels. They keep track of cash balances and flows at different locations. A company's cash management policies include: investment of cash in excess of day-to-day needs and short-term sources of borrowing. Other influences on cash flows: capital

expenditures, mergers and acquisitions and disposition of assets are important to ensure optimum working capital.

Managing Accounts Receivable

Accounts receivable – This refers to money due to the company from sales to customers. The objectives in managing accounts receivable are process and maintain records efficiently, control accuracy and security of accounts receivable records, collect on accounts and coordinate with treasury management. The management of accounts receivable is largely influenced by credit policy and collection procedures (Brigham & Ehrhardt, 2008; Moyer, McGuigan, & Kretlow 2009).Credit policy and collection procedures affect cash inflows, sales, and risk of bad debts (Hill & Sartoris, 1992). Any changes made in credit policy will have direct impact on working capital performance. For instance, a decision to reduce or increase credit period is to influence the cash conversion cycle. Gitman, 2003; Moyer, McGuigan, & Kretlow 2009 stated that a credit policy normally includes credit standards, credit period, and cash discounts. Credit standards specify requirements to establish the worthiness of customer's credit background.

Credit Analysis

Granting credit increases sales and profitability but it also increases Costs of financing the granted credit. Chance is that customers won't pay and financing receivables becomes another issue to be addressed. Receivables management examines the trade-off between increased sales and the costs of granting credit, (Pandy, 2005). In granting credit management have to critically assess the cost and benefit before granting the credit.

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Managing Customers' Receipts

The most efficient method of managing the cash flow from customers depends on the type of business. Methods of speeding the deposit of cash collected by customers: Using a lockbox system and directed deposits, Encouraging customers to use electronic fund transfers, Point of sale (POS) systems and the use of direct debt program. For check deposits, performance can be monitored using a float factor technique which is expressed as:

Float factor $=$ (Average daily amount in transit)/Average daily deposit

The **float** is the amount of money in transit. The float factor measures how long it takes for cheques to clear. The larger the float factor, the better. Companies may use a captive finance department to centralize the accounts receivable functions and provide financing for the company's sales.

Managing Accounts Payable

Accounts payable arise from trade credit and are a spontaneous form of credit. Credit terms may vary among industries and among companies, although these tend to be similar within an industry because of competitive pressures. Accounts payables is one of the major sources of spontaneous finance (Gitman, 2009; Hill & Sartoris, 1992; Moyer, McGuigan, & Kretlow 2009). Companies along with their suppliers need to agree to establish a relationship or partnership with specific arrangements including credit terms (Hill & Sartoris, 1992). Credit terms generally include payment terms, such as credit period, cash discount, credit guarantee, and so forth (Gitman, 2003;Moyer, McGuigan, & Kretlow 2009). Credit period refers to time specifying maximum days in which payment should be made to suppliers.

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Cash discount refers to incentives (usually in percentage) given to companies for early payments.

Factors to consider in requesting for credit include: Company's centralization of the financial function, number, size, and location of vendors, trade credit and the cost of alternative forms of short-term financing, control of disbursement float (i.e., amount paid but not yet credited to the payer's account), inventory management system and e-commerce and electronic data interchange (EDI), which is the customer-to-business payment connection through the internet.

Operating cycle = Number of days of inventory + Number of days of receivables.Net operating cycle or Cash conversion cycle = Numbers of days of inventory + Number of days of receivables – Number of days of payables. Other ways of creating payables include:

Bank notes – These are monies the company has borrowed from a commercial lender, such as a bank. The money must be repaid to the bank within a stipulated time.

Other current liabilities – These are short-term liabilities, usually accruals. Companies always owe employee salaries, interest, and taxes. Unpaid expenses are estimated and listed as accruals.

Managing Inventories as an Internal Working Capital Determinants

Inventory – This is an investment that the company has made in the raw materials for manufacture and production of goods. Inventories are the least liquid categories from the entire current assets highest yield should be provided by it to justify investment (Block & Hirt, 1992). A company's ability to respond to market demands is largely dependent on how responsive its

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suppliers are to supplying materials for production, sale or rendering services. Therefore, closer relationships with suppliers are important for companies to cope with fluctuation of market demands (Bowersox, Closs, & Stank, 2003).

Furthermore, maintaining appropriate inventory levels involve the cycle of business activities, and it incurs inventory related costs such as ordering, carrying, and stock out costs (Moyer, McGuigan, & Kretlow, 2009). Ordering cost refers to all costs of placing orders and receiving materials into the warehouse. Carrying cost refers to all costs of holding materials for certain periods of time. Inventory, which is one of the important elements of current assets, reflects the investment of a firm's fund. Hence, it is necessary to efficiently manage inventories in order to avoid unnecessary investments (Singh, 2008).The objective of managing inventory is to determine and maintain the level of inventory that is sufficient to meet demand, but not more than necessary. Motives for holding inventory:(i) Transaction motive which involves holding enough inventory for the ordinary production-to-sales cycle.(ii) Precautionary motive aim at avoiding stock-out losses.(iii) Speculative motive which ensures the availability and pricing of inventory.

Approaches to Managing Levels of Inventory

One of the ways of managing levels of inventory is Economic Order Quantity which includes: Reorder point—the point when the company orders more inventories, in order to minimizing the sum of order costs and carrying costs. Another way is Just in time (JIT), It is an order made only when inventory is needed, that is when inventory falls below a specific level.

Materials or manufacturing resource planning (MRP): This involves Coordination of production planning and inventory management. The

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appropriateness of an inventory management system depends on the costs and benefits of holding inventory and the predictableness of sales. Measures for assessing inventory management involves using: Inventory turnover ratio and Number of days of inventory,(Pandy, 2005).Number of days of inventory = Average time it takes to create and sell inventory

$$\text{Number of days of inventory } = \frac{\text{Inventory}}{\text{Average day's cost of goods sold}} = \frac{365}{\text{Inventory turnover}}$$

When comparing turnover and number of days of inventory among companies, the analyst should consider the different product mixes among companies. Prepaid expenses – These are expenses the company has paid ahead of time. This could include rent, payment on leases, or other expenses paid ahead of time. Accounts payable – These are the bills for which the company owes money to vendors or suppliers. This includes operating expenses and inventory. The company has bought these services on credit. The money is generally due within 30 to 60 days.

Investing Positions/Activities/Capacities:

Investing position involves managing short term investments and Funds. Prior studies have shown that leverage is a significant contributor to a firm's choice on the level of its working capital investment, (Ban˜os- Caballero, Garcı´a-Teruel & Martı´nez-Solano, 2010a; Chiou, Cheng & Wu, 2006; Kargar & Blumenthal, 2004). Working capital investment are the assets that are not directly used in the operations of the business. This includes investments in debt and equity securities of other companies, land purchased to profit from price appreciation, noncurrent receivables, and any cash kept aside for a special purpose that is not accounted for as current asset. The

argument of the pecking order theory implies that there is a very strong relationship between investment in working capital and information asymmetry. Due to this, firms with different characteristics, such as growth opportunities, size, asset palpability etc., would result in different investment policies in working capital depending on the roles played by these characteristics in aggravating and/or reducing the problem of asymmetric information and the costs associated with the level of asymmetric information.

Aside from the pecking order theory, the free cash flow hypothesis by Jensen (1986) is another theory that may have implications for the level of working capital investments chosen by a firm. It emphasis the agency costs of free cash flow. According to this theory, managers would accumulate cash in order to increase the amount of assets they can control and to gain discretionary power over their firm's investment decisions (Ferreira &Vilela, 2004). Thus managers prefer to hold more cash and high levels of investment in working capital to reduce the firm's investment risk to lessen the probability of bankruptcy and place too much importance on the precautionary motive of holding cash (Opler & Titman. 1994).

Managing and measuring Financial Performance

The major performance measurement indicators commonly used were profitability and liquidity. Adu-Amoaba (2013) stated that Liquidity and profitability are two important measures of the performance of a business. This is because liquidity looks at how easily a business can convert its assets to cash to meet short-term obligations. Profitability on the other hand is the basic aim of every company that is into business to make profits. Liquidity is directly related to working capital as working capital has to do with the

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amount of funds used to run a business on a daily basis. Another study on the factors affecting working capital management have found a significant negative relationship between the debt ratio and net liquidity balance and working capital requirements.

Profitability is measured using Return on Asset (ROA), Return on quity (ROE) and Gross Operating Profit Margin (GOPM).There are many different measurements of firm financial performance among the researchers who studied the relation between WCM and firm profitability. The simplest form among these measurements is Return on Assets (ROA), which is measured by dividing gross income with total assets. This is used by Sharma and Kumar (2011), Falope and Ajilore (2009), Wang (2002), Samiloglu and Demirgunes (2008), Garcia-Teruel and Martinez-Solano (2007), Nazir and Afza (2009) and Karaduman et al. (2011). According to Padachi et al. (2006) ROA is a good measure for firm profitability, because it relates the profitability of a company with its assets.

Authors like Hager, (1976); Jose, et al., (1996) provided evidence of an inverse relationship between working capital and profitability, where firms that keep lower investment in working capital tend to be more profitable, which is achieved by minimizing the cost of holding unproductive assets, such as cash and marketable securities, rather than by increasing payables; reducing the dependency of external financing preserves firm's debt capacity, since less short term borrowing is required to provide liquidity.

Padachi et al. (2010) uses gross operating profit divided by total assets. Zariyawati et al. (2009) and Shin and Soenen (1998) used almost the same measurement, the only difference is that they used gross operating profit

before depreciation divided by total assets. Shin and Soenen (1998) also used a second measurement of firm profitability, which is gross operating profit before depreciation divided by net sales, but this measurement is not used by any other researcher. Working capital and profitability have double-edge relationships. According to Deloof, (2003) efficient WCM is fundamental for maximizing profitability. On the one hand, more profitability makes firms stronger to negotiate with both suppliers and customers, and firms can use these competitive advantages to improve their liquidity (Shin &Soenen, 1998; Petersen &Rajan, 1997). On the other hand, working capital has important effects on profitability. More investment in working capital means more sources engaged and make more opportunity cost for firms (Deloof, 2003).

More recent studies on the relationship between WCM and profitability, (Baños-Caballero, et al., 2012; Silva, 2012), point to a curve-linear relationship, indicating that there is an ideal working capital level that maximizes profitability, which shows that both high and low working capital levels are related to a lower profitability. Such relationship between WCM and profitability, relate positively to low levels of investment in working capital and negatively for high levels of investment in working capital, showing the greater profitability effect but also the greater risk effect for firms with low levels of working capital (Baños-Caballero, et al., 2012). If the companies efficiently manage their inventories, accounts receivables and cash margins it will improve their profitability (Rehman, 2006),

Hill, Kelly, and Highfield (2010) tried to determine the more important factors, which affect working capital management in US corporations. Their finding disclosed that Working Capital Requirement (WCR) positively related

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to the operating cash flow, and negatively correlated to the financial distress and market to book ratios. They found no evidence for relationship between gross margin profit, market share, and WCR. Gill (2011) focused on the Canadian companies to determine working capital management. Applying panel data analysis, OLS regression and correlation coefficient, his results showed that working capital requirement positively correlated to the operation cycle and return on assets. Moreover, working capital requirement negatively correlated to the firm size and Tobin's q. His findings indicated no significant relationship between working capital requirement, and debt ratio and operation cash flow. From these studies, a conclusion was made that firm's investment in working capital are highly influenced by the sales growth and industry practices (Hawaii et,al., 1986) and the two main goals of any firms are liquidity and profitability.

In a similar but not the same study in Ghana, Agyemang and Asiedu (2013) used three measures of working capital to test whether working capital management has a significant effect on profitability. The findings indicated clearly that 'one of the measures (cash conversion cycle) in the research has positive but insignificant effect on profitability of the manufacturing firms in the Accra Metropolis and for that matter Ghana. Also, if the debt to asset ratio is higher than the required working capital for daily organization operations profit will be reduced because of the need to settle the debt.There exist many types of costs that are related to the excesses and shortages of the levels of working capital in terms of investing and financing. If these costs are effectively managed, then the overall profitability of the firm can be increased to a maximum level. The implication of these objectives is that the decisions

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that maximize the profitability do not tend to increase liquidity (Moyer, McGuigan, & Kretlow, 1995).

Liquidity Management

Liquidity is the ability of the company to satisfy its short-term obligations using assets that are readily converted into cash. Maximizing profit is the main objective for firms; however, firms need at the same time to focus on liquidity to prevent insolvency (Raheman & Nasr, 2007). Liquidity management is the ability of the company to generate cash when and where needed. Liquidity management requires addressing grafts and tugs on liquidity. Grafts on liquidity are forces that delay the collection of cash, such as slow payments by customers and obsolete inventory. Tugs on liquidity are decisions that result in paying cash too soon, such as paying trade credit early or a bank reducing a line of credit. Measure of Liquidity involves using the Liquidity ratios such as Current and Quick ratio and cash conversion cycle. Current ratio is the ability to satisfy current liabilities using current assets and Quick ratio is the ability to satisfy current liabilities using the most liquid of current assets. Authors like Shin &Soenen (1998) and Deloof (2003) suggest an inverse relationship between WCM determinants and profitability, showing that a reduction in working capital accounts, namely accounts receivables and inventories, to a reasonable extend, increases profitability, arguing that less profitable firms need more time to pay their bills.

Evidence from Portugal by Marshal (2005) found a relationship between working capital determinants and profitability. The research is about determinant factors of liquidity (working capital) and found that the amount of any company's working capital is swayed by certain factors. Obviously due to

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differences in the degree of the presence of these factors in different companies, the need for appropriate working capital is also different. Chiou and Cheng (2005), in a study on the factors affecting operating cash flow on the working capital, have found that operating cash flow has a significant positive relation to net liquidity balance and a significant negative relation to required working capital and therefore have effect on the management of organization's working capital.

In practice, Navender, Menon and Shewtha, (2009) show that a firm may lose several profitable investment opportunities or suffer a liquidity problem if the working capital is too low or it is improperly managed. Management of working capital which aims at maintaining an optimal balance between each of the working capital components, that is, cash, receivables, inventory and payables is a fundamental part of the overall corporate strategy to create value and is an important source of competitive advantage in businesses (Deloof, 2003).

Furthermore, Chiou and Cheng (2006) have tried to decide the important factors affecting working capital management in Taiwan's firms. The study considered both external variables (macroeconomic variables) and internal variables (firm-specific variables). Their findings indicated that during the economic decline firms have more working capital requirements. According to Arnold (2008) found cash conversion cycle as one of the measures of liquidity and opined that the shorter this cycle, the fewer resources are needed by the company. So the longer the cycle is the greater will be the investment in the working capital. But also a longer cycle could increase sales, which could lead to higher profitability. But this longer cycle, will also lead to higher

investment in inventories and receivables which could rise faster than the benefits of the higher profitability.

The relationship between the external determinants of working capital andthe financial distress levels of the selected firms.

The external determinants of working capital management (WCM) are variables outside the business organization that directly or indirectly influence the working capital management which eventually affect the financial distress level of business organizations.The external working capital determinants include: Gross Domestic Product (LGDP), Inflation Rate (LINFL), Interest Rate (LINTR), Exchange Rate (LEXR), and Market value of the firms' equity (MKTVE) and other non-quantifiable factors as discussed below:

The external variables can be broken down into quantitative and qualitative variables. The quantitative and the qualitative variables can be further classified into controllable and uncontrollable determinants of working capital management. The aim of making this synthetic analysis is to identify which external variables are quantifiable and can also be controlled by management in order to assess their impact on financial distress levels.

External macroeconomic factors such as the macroeconomic policy stability, gross domestic product, inflation, interest rate, exchange rate, tax laws and political instability are all other determinants variables that affect the working capital management and also affect the financial performances of manufacturing firms. For instance, the trend of GDP affects the demand for firms' products. During the declining GDP growth the demand for goods and services generally falls which in turn negatively affect the profitability of companies. On the contrary, in a growing economy as expressed by positive

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GDP growth, the demand for goods and services is high due to the nature of business cycle. During boom the demand for credit is high compared to recession (Athanasoglou, Sophocles & Matthaios, 2005).

According to Vong and Chan, (2009) in relation to the Greek situation, the relationship between inflation level and company's profitability is remained to be debatable. The direction of the relationship is not clear.Darun (2011) asserted that a wide range of internal and external factors influence WCM, and identified six external factors believed to influence WCM in a mostly holistic manner: Political situation, economic and business environment, industrial effects, legislation, competition, and financial regulation. The review by Darun further found that the effect of these external factors varies across industrial and geographical settings.   For example, in the United Kingdom legislation reports how small business owners go about charging interest on overdue invoices (Peel, Wilson, &Howorth, 2000), to protect small enterprises who are extremely dependent on efficient working capital, while many companies have encountered difficulties in managing working capital components during economic recessions due to global uncertainties (Claessens, 2000).

In other words, legislation may have only restricted effects while economic conditions appear to affect many companies across industries or borders and some companies are more sensitive to environmental changes than others. Similar study by (CFA) Institute of Chartered Financial Analysts (2013), also identified internal and external factors that affect working capital needs of business organisations. The external factors are:Banking services, interest rates, new technologies, new products, the economy and competitors.

The Qualitative and Quantitative External Determinants

External qualitative determinants of working capital are variables in the external environment of the business organisation that cannot be measured in monetary terms but have significant effect on working capital management. They include: new technologies, new products, competitors, legislation, energy situation, political situation, financial regulation and banking services.

New Technologies:

Developments in the technologies have facilitated product improvements and introduction of new products and have significantly improved the marketability of the products. The fast changes in technologies also create problems for enterprises as they render plants and product obsolete more rapidly than it used to be. According to Fairchild (2005)Information technology is an integrative platform that improves information flow within and between organizations and enhances communication capability and quality of working capital decisions.

Lieberman et al. (2009) studied the determinants of inventory policies of automotive companies in the United States. They found that both technological and managerial factors have a significant influence on the determining of the levels of inventories. Technological factors, like longer setup and processing times increase the level of inventories. Today managers adopt changes in technology to achieve success in business and industry. Internet and telecom system is the portion of technological development in the world which today have changed the whole world. It changes people and business operation. It leads to many new business opportunities apart from the many existing systems. Access to the internet communication facilities enable

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business owners to connect to a large numbers of employees to work from one place/ home to another place in the globe. Information super- highway provides opportunity to finance officers to access to richer source of information. It helps business organisations in sales and exchange of goods and services through the virtual markets. It provides opportunity to customers for accessing online shopping through the internet technology.

New Products

The final force in the Porter's model is the threat of substitute products-The product of industries that serve identical consumer needs as those of the industry being analysis. For instance, organisations in the breweries industry compete directly with those in the tea and soft drink industries. In the case of substitute products, if the price of the Malta Guinness rises too much relative to that of tea or coca cola drinks, then malt drinkers will switch from malt to those substitutes. The existence of close substitutes creates a strong competitive threat, limiting the price an organization can charge for their product. The implication of the new substitute product for working capital management is that firm's sales will fall leading to creating of more credit which lead to more receivables.

Competitors

Growing demand trends provide a greater expansion of the production activity. Sharma and Kumar (2011) argued that the positive relation they found between accounts receivables and profitability is caused by the fact that Indian firms have to grant more trade credit to sustain their competitiveness with their foreign competitors, who have superior products and services demand. When demand is growing ultimate result is a searching of entrants of

customers or if existing customers are purchasing more of an industry products. When demand is growing, organisation can increases revenues without taking a market share away from other companies. Therefore, declining demand result in more competition from rivalry organisation. It is very difficult to maintaining revenue and market share of the organisation. Consumers are leaving market place or when individual consumer buying less. Therefore, declining demand constitutes a major threat to organisation's working capital management because it affects revenue and lock up inventory.

Legislation

Sound financial legal system is the basic requirement for running of the business operation within the state. Managers should be aware of various business laws which are protecting consumers, competitors, and organisations. Business organisation should be aware of the laws which are relevant to companies, competitors, intellectual property, foreign exchange, labour and so on since these affect the working capital management and financial performance as a whole.

Energy situation

According to International Energy Agency (2006), in 1998, low rainfall impacted on Ghana when Akosombo dam level fell to 237.5 feet compared to minimum operating level of 240 feet. Frequent load-shedding ensued and many bulk consumers such as mines and manufacturing companies were rationally supplied with power. In march 2007, the government closed down Aluminum Manufacturing Company (Valco) in Ghana which is highly power dependent. What will be the effect of this power situation on existing inventories at the time? Possibly inventories investment will be lying idle

leading to capital lock up. This scenario has serious ramifications on working capital management cycle and the debilitating effect on financial performance.

Political Situation

Government policies, rules and regulation are controlling and monitoring the business enterprises and its activities in the state. Secondly, the type of government administration of the state can dictate the business policy of state. These things should be evaluated by the finance manager from point of view of business. The Manager should be steady about the changes in the regulatory framework of the government and impact on the business. Government tax and monetary policies are critical and affect the business organization in the state.

Fiscal Policy and its Effect on Businesses' Working Capital:

Fiscal policy involves the use of government spending, taxation and borrowing to affect the level and growth of aggregate demand, output and employments. Fiscal policy is also used to change the pattern of spending on goods and services. It is also a means by which a redistribution of income and wealth can be achieved. It is a mechanism of intervention to correct the free-market failures. Changes in fiscal policy affect aggregate demand (AD) and aggregate supply (AS).

Fiscal Policy and Aggregate Demand:

Normally fiscal policy has been seen as an instrument of demand management. This means that fluctuations in government expenditure, direct and indirect taxation and the budget balance can be used as a pledge to help smooth out some of the instability of national output particularly when the economy has experienced an external shockwave and is in a recession. The

Keynesian school of taught contends that fiscal policy can have powerful effects on demand, output and employment when the economy is operating below full capacity with respects to national output, and where there is a need to provide a demand-inducement. Monetarist economists believe that government expenditure and tax changes only have a transitory effect on aggregate demand, output and businesses and that the tools of monetary policy are more active mechanism in controlling inflation and maintaining macroeconomic stability.

The fiscal policy transmission machinery and its effect on working capital can be illustrated in a diagram that categorizes some of the channels involved with the fiscal policy transmission mechanism. In the example shown below in figure 5, the analysis focus on an expansionary and contractionary fiscal policy designed to boost or reduce demand and output respectively and its effect on businesses working capital. .

Fig. 2. The effect fiscal policy on working capital

Source: A
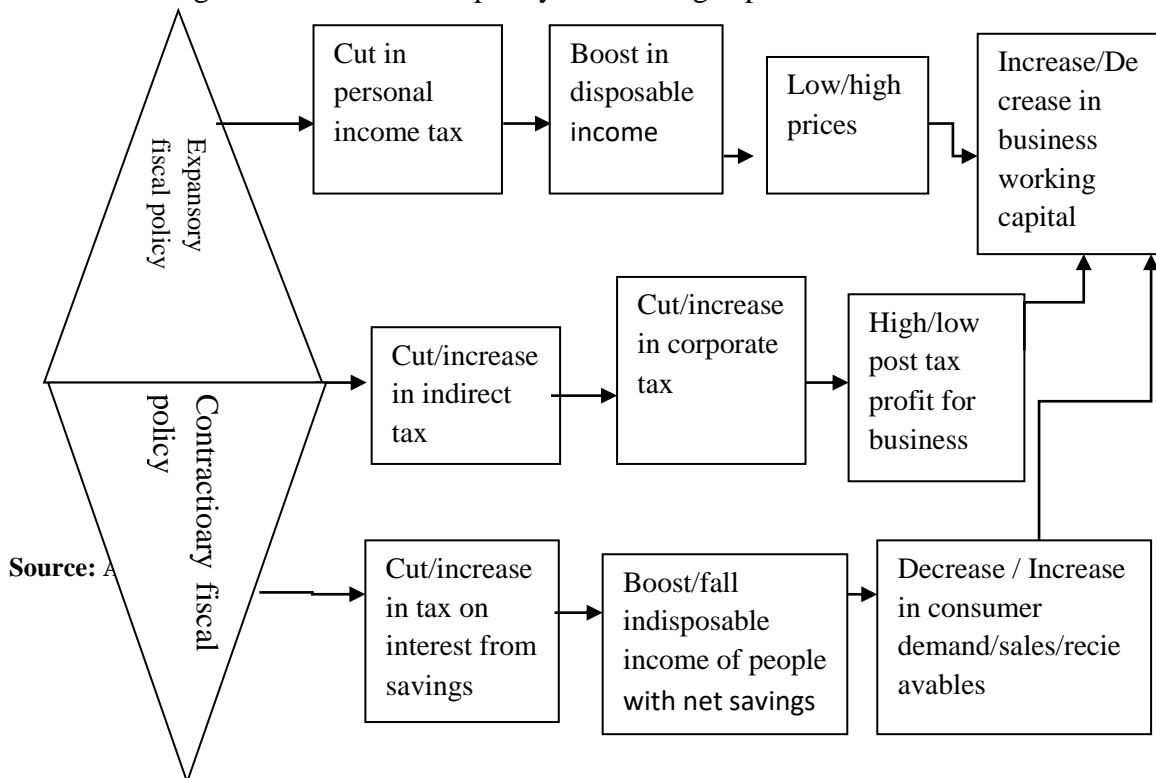
The multiplier effects of an expansionary fiscal strategy depend on how much extra productive capacity the economy has; how much of any increase in disposable income is spent rather than saved or spent on imports. And also the effects of fiscal policy on variables such as interest rates. A contractionary fiscal policy would involve one or more of the following: A cut in government expenditure either in real terms or as a share of GDP, an increase in direct and/or indirect taxes, an attempt to reduce the size of the budget deficit.

External Quantitative Determinants of Working Capital Management include: Interest rates, GDP growth, inflation, exchange rate and income levels and market value of equity. These determinants are explained as follows:

Interest rates,

The interest rate network is the primary mechanism at work in conventional macroeconomic models. The basic idea is straightforward: Given some degree of price stickiness, an increase in nominal interest rates, for example, translates into an increase in the real rate of interest and the user cost of capital. These changes in turn lead to a postponement in consumption or a reduction in investment spending. This leads to a decrease in aggregate demand, which decreases inflation, employment, and real GDP which finally affect the demand of the firms' product and working capital.

GDP growth,

According to the Institute of Chartered Financial Analysts [CFA](2013), Gross Domestic Product (GDP) is the total output of all economic activity in a country over a given period and a country's GDP will include domestic output by foreign owned firms. Empirical evidence suggests that macroeconomic

factors such as GDP would influence trade credit and investment in inventories. Smith (1987) and Walker (1991) argued that the state of the economy influences the level of accounts receivable. Moreover, Lamberson (1995,p 45) have found that the amount of working capital of the small firms had increased during economic slowdown. GDP has a mathematical relationship with the measures of gross national income (GNI) and net national income (NNI) GNI is the sum of all incomes for residents of a country regardless of the location of the assets of these residents. NNI = GNI less depreciation of physical capital GDP + interest, dividend, rent and profit abroad = GNI, GNI – physical capital depreciation = NNI.

Inflation,

Inflation is a rise in the price level of general goods and services. When the increase in prices is rapid, due to a war or any other upheaval it results in people holding lesser money. This scenario is called hyperinflation. These crises do not permit the government to collect taxes, leading to quick and large increases in prices in a short period of time. Economies in the middle of a tough recession see their inflation rates go below 0%, that is in the negative (CFA, 2013). During a recession demand falls and with it prices of goods. People further wait to make purchases. This leads to a further decrease of aggregate demand. Such a situation when inflation rates go negative is called deflation. When the inflation rate starts to reduce at a slow rate it is called disinflation. This fall in inflation rate occurs over a short term and does not necessarily herald a slowdown in the economy, unlike deflation.

Inflation is a common problem that every finance manager encounters during his capital budgeting decision making process (Kannadhasan,2005). It

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also depends on whether inflation is anticipated or unanticipated. When making cash budgeting decisions which is an aspect of working capital management, with inflation in mind, it is required to distinguish between expected and unexpected inflation (Kannadhasan, 2005). If the inflation rate corresponds to what the financial manager is expecting, then he or she can put in place strategies to compensate for the raising cost in products and services and to ensure the sustainability of the business.

I use the Consumer Price Index or CPI to measure inflation. It is a fixed-weight price index, which takes the quantities in some base year as being the typical goods bought by the average consumer during that base year, and then uses those quantities (same basket) as weights to calculate the index in each year.

$$\text{Current year CPI} = \frac{\text{Cost of base year quantities at base year prices}}{\text{Cost of base year quantities at current prices}} \times 100$$

CPI helps calculate the cost of living and the value of money. I can arrive at the inflation rate by calculating the annual percentage change in price levels. However, according to CFA (2013) CPI is not an altogether accurate measure of inflation rates as it tends to inflate it. It has inherent biases, some of which are:

New product Bias: If I decide to compare the inflation rates today with those say 10 years back we need to compare related goods. For instance, if I compare phones, the new touch phones would be more expensive than the old rotational dial phones. This would get factored into the CPI making the current CPI more expensive. **Quality Change Bias** arises from Innovative products that come in with more technological improvement and are hence more expensive. However, the increase in prices is due to innovation rather

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than inflation. CPI sees it as inflation and states it as such. Also, Product **Substitution Bias** which occurs when consumers switch from one product to a similar product due to increase in prices, CPI records inflation rates as high in that product. If consumers derive the same amount of satisfaction or utility by the switch this is not factored by CPI. Only the increased usage of the substitute product is documented. Channel Substitution Bias arises because in times of increased prices, people shopping from super markets may choose to go to discount stores but CPI does not factor in outlet substitutions.

Exchange rate

An exchange rate is a measure of the value of one currency in units of another currency. For example USD/GH¢ 3.33 measures the value of cedis in terms of dollars; 1 USD =GH¢3.33. When a currency declines in value, it is said to depreciate. When it increases in value, it is said to appreciate. If the exchange rate moves from ¢3.33 to ¢3.45, that means you can buy more cedis with the same one dollar. The cedi has depreciated in value and the dollar has appreciated. The exchange rates that we see every day in newspapers are the nominal exchange rates. It's the relative price of two different currencies. The real exchange rates on the other hand measure the price of domestic goods in terms of foreign goods, how much foreign good you could exchange for domestic goods.

Income levels

Consumer desire is characterized by restricted disposable incomes and many unsatisfied desires because human wants are infinite. If the consumer decides to spread his discretionary income and time he will still be confronted with a number of alternatives to select from such items as computer, phone,

etc. Income distribution is also one of the important factors that influence the firm's financial decision. Company may be planning to identify new opportunities for firm's investment decisions by measuring changes in income distribution, savings patterns for different level of individual for the purpose of forecast and assess the changes in income patterns. Total Household Income level comprises income from employment, agricultural and non-agricultural activities such as rent, remittances, and other sources.

A survey from Ghana living standard report by BOG(2013) indicates that the average annual household income in Ghana is about GH¢1,217 whilst the average per capita income is almost GH¢400. Using the prevailing average exchange rate of June 2006, ¢9,176.475 old Ghana cedis to the US dollar, average annual household income and average per capita income amounts to US$1,327 and US$433 respectively. The highest income earners has an average annual income of GH¢1,544 and for the lowest the corresponding income is about GH¢728.

This means that a household in the highest living standard has an income that is about twice as much as that of a household in the lowest standard. The annual per capita income in Ghana is about GH¢397 implying that a Ghanaian lives on an average income of less than GH¢1.10 per day. The highest social class has an average per capita income of about GH¢688 which is 1.7 times higher than the national average and almost six times more than that of the lowest class.

On the other hand, disparities between the two extreme class are very discouraging if the national average is considered. People who fall in the lowest standard therefore have an average per capita income of about GH¢10

per month which is about three times less than the national monthly average minimum income of GH¢150. At the regional level, Greater Accra has the highest average annual income of GH¢1,529 that is higher than the average national income of GH¢1,217. This is followed by Northern and then the Central, Upper West, Upper East and Volta regions have the lowest mean annual income of less than GH¢1,000.

In terms of per capita income, four regions have an annual per capita income above the national annual average (GH¢397) with Greater Accra recording the highest GH¢544. Upper West and Upper East regions have average annual per capita incomes of less than GH¢130 while Northern and Volta have per capita incomes less than GH¢300. This might accounted for the reasons why many manufacturing company industries are located in the greater Accra region where the purchasing power is higher than all other regions in Ghana. The survey further reveals that Greater Accra Region is better off than the other regions, with almost 50 per cent of its households falling within the highest quintile, and a much lower proportion of households (about 5%) within the lowest standard. Ashanti follows with almost 40 percent and nearly 8 percent of its households within the highest and lowest class respectively.

On the other hand, Northern, Upper East and Upper West have much proportions of households living in extreme poverty. Upper West is the highest poor region and high proportions of households ranging from 32.9 percent in Northern to 76.7 in Upper West in the lowest living standard. This indicates very high incidence of poverty in the northern parts of the country. In terms of place of residence as shown by the survey, a household in urban

localities has an average annual income of GH¢1,415 while a household in rural localities has an average annual income of GH¢1,067. Among the rural localities, rural Savannah has the highest average annual income of GH¢1,115 while rural forest has the lowest, GH¢1,038. On average, the annual per capita income of urban localities is about GH¢517 implying an overall average income level of GH¢1.44 per person per day while residents in rural localities have annual per capita income of GH¢305 and live on less than GH¢0.85 per day.

Market value of equity

Market value of equity is simply, the number of shares issued multiplied by earning per share (Abdulai, 2007). In using the market values reserves are not included in the equity. In determining the market value of equity it is important to distinguish between geared and ungeared firms because the market value of all-equtiy finance firms is usually higher than firms with equity and debt.

A Change in the Working Capital Component and its Influence on Financial Distress Level of Manufacturing Firms in Ghana

The net working capital components as used in this study include: Current Assets: inventory, payables and receivables. In this study the extant literature reveals the components of working capital as consisting of current assets less current liabilities. The working capital is affected by a number of factors including the nature of the business, credit policy, conditions of supply, price level changes, size, debt ratio, returns on asset and current ratio. Also, in this study the external determinants of WCM, which include controllable and uncontrollable variables, will be used for analysis. The internal factors

influencing the management of working capital and how changes in the external variables influence the internal variables will be discussed. For instance, how does a change in GDP, Inflation or exchange rate affect inventory, receivables, sales and payables of the company? Also this study intend to find out how these external and internal determinants influence financial performance (profitability and liquidity) of manufacturing companies in Ghana through a review of related studies of WCM .Current liabilities: payables, trade creditors and over-draft affect working capital management.

External finance, debt or new finance issues, may be more expensive than internal finance because of financial market imperfections (Baños-Caballero, Gracia Truel and Martinez-Solano (2012). Whited (1992) and Fazzari and Petersen, (1993) showed that small firms also face greater financial constraints, which also increases trade credit received from suppliers, using this form of credit when other forms are unavailable or have been exhausted. Within the macroeconomic context, gross domestic product (GDP) is an important determinant of WCM. According to Lamberson (1995), changes in economic activity affect WCM decisions of small firms, although these responses may be different from those taken in large firms. Further, Lamberson (1995) finds a negative relation between inventory levels and GDP, where firms hold less inventories during economic expansion and more inventories during recessions.

Moreover, according to the trade-off theory, smaller firms have a higher likelihood of bankruptcy, as compared to larger firms which are more diversified and have access to capital and monetary market. This might affect

the trade credit granted, because, according to Petersen and Rajan, (1997) and Niskanen and Niskanen, (2006), firms with better access to capital markets extend more trade credit. In addition, Nakamura and Palombini, (2009), found a negative relation between size and accounts receivables, suggesting a greater market power for large firms than small firms that provide more trade credit to guarantee product quality.

For Chiou, Cheng and Wu (2006), there is a negative relation between profitability and working capital requirements, once more profitable firms have better access to external capital. On the contrary, Blinder and Maccini, (1991), finds that firms reduce inventories during economic recessions, also Chiou, et al., (2006) finds a positive relation, having firms more receivables and inventories during recessive economic periods. The negative association between company's accounts receivables and profitability suggests that the higher level of accounts receivables tend to increase the cash gap and therefore will reduce the working capital. Also the inverse association between the inventory turnover and ROA causes the Productivity volume decrease (Lazaridis & Tryfonidis, 2006).Effective dispute management procedures in relation to customers would help in freeing up cash otherwise locked in due to disputes. It will also improve customer service and free up time for legitimate activities like sales, order entry and cash collection. Overall, efficiency will increase due to reduced operating costs (Gordon, 2011). Adapting a customer oriented operations would also yield good results. Where feasible, helping them to plan their inventory requirements efficiently to match your production with their consumption will help reduce inventory levels.

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The overall conceptual framework of how these quantitative determinants in the model influence financial distress is represented in the diagram below:

INTERNAL DETERMINANTS:

Quantifiable:

    Growth

    Liquidity

    Profitability

    Size

    Age

Non-Quantifiable:

    Managerial practices

    Employees competence

EXTERNAL DETERMINANTS:

Quantifiable:

    Gross domestic Product

    Inflation

    Policy Interest rate

    Exchange rate

    Fiscal stance(tax)

Non-Quantifiable

    Political situation

    Competition

    Technology

    Legislation

The Effect of Quantifiable

Corporation

The effect of Quantifiable

Corporate Financial Distress

Source: Author's own framework

Fig.3. Conceptual framework on Working Capital Determinants and financial distress

CHAPTER THREE

RESEARCH METHODOLOGY

An overview

This Chapter discusses the procedure that was followed to conduct the study. It presents the research design, population, sample procedure, research instrument,data collection procedure and data analysis plan.

Research Design

This descriptive study is based on secondary data obtained from published statements of accounts of some selected listed manufacturing firms in Ghana Stock Exchange. It uses panel data due to the advantage that it has. Panel data helps to study the behaviour of each manufacturing company in Ghana over time and across space (Baltagi, 2005; Gujarati, 2003).The researcher also used logical positivism or quantitative research to measure and test hypothetical generalizations (Hoepfl, 1997). This study also emphasize the measurement and analysis of causal relationships between variables which is consistent with Creswell (2003).

Quantitative research allows this study to familiarize itself with the subject matter to be studied, and perhaps generate hypotheses to be tested. In this study the emphasis is on the working capital determinants (Bogdan & Biklen, 1998), the information is in the form of numbers that can be quantified and summarized, the mathematical process is the norm for analysing the numeric data and the final result is expressed in statistical terminologies (Charles, 1995). A quantitative researcher attempts to fragment and delimit phenomena into measurable or common categories that can be applied to all of the subjects or wider and similar situations (Wilner, 2000).

The research methods involve the use of panel least square estimates and standardised measures ratios so that the varying perspectives and experiences of companies can be fit into a limited number of predetermined categories to which numbers are assigned (Patton, 2001, p.14). For example, the study prepared a list of behaviour to be checked or rated by an observer using a predetermined schedule of numbers (scales) as an instrument in this method of research. Thus, a quantitative researcher needs to construct an instrument to be used in standardised manner according to predetermined procedures. Creswell (2003) explained that quantitative methods are used chiefly to test or verify theories or explanations, identify variables to study, relate variables in questions or hypotheses, use statistical standards of validity and reliability, and employ statistical procedures for analysis.

Data Collection and Sample Selection

In this context, manufacturing firms refers to those firms whose activity result in the production of raw materials and/or conversion of the raw materials into semi-finished goods or finished goods. The data needed for the empirical testing of research hypotheses were gathered from database that included the secondary data of the financial statement of manufacturing firms listed in the main board of Ghana Stock Exchange (GSE).The data of this study is derived from the year-end balance sheets and income statements of the firms in the sample during 2004-2013 period.

Sampling Design and Procedure

All firms in the manufacturing sector in Ghana Stock Exchange database during the period of 2004 to 2013 were selected at the initial stage of this study. However during, the data collection period some companies were

dropped because not all of the companies had all data required for the analysis. Furthermore only listed manufacturing companies with relevant data were selected for this study because they usually publish their audited account which makes them more authentic as compared to the unlisted companies.

The following Figure 7 below describes the characteristics of the listed manufacturing companies in Ghana that were finally selected for this study.

Table 1. Some selected manufacturing companies in Ghana

Name of company	Location	Product
African Champion Ind	Accra	Toliet roll, tissue papers
Poineer Kitchen Ltd.	Accra	Furniture, wardrobe etc.
Cocoa processing	Accra	Chocolates, cocoa powder
FanMilk Company	Tema	Yoghurt, Tampico, cocoa
Unilever Ghana Ltd	Tema	Soap, toothpaste, brush,
Camlot Ghana Ltd	Accra	Imperial leather, hair lotion
BensoOilPalm Plants	Takoradi	Palm oil
Guinness Ghana Ltd	Kumasi	Malta, Club beer, shandy
Aluworks Ghana Ltd	Tema	Roofing Sheets, Cook utensils
Starwin Products Ltd	Accra	Pharmaceutical products

The above table these manufacturing companies were selected for this study because they possess all characteristics that is required for a typical Ghanaian manufacturing company and have all of figures or data required for this study.

In order to establish relationship between working capital variables and financial distress level of the selected companies the variables of interest were proxied and represented in a form of table as follows;

Table 2: **Operationalization of the Study Variables**

This table presents the measurements that were used to operationalize the study variables.

The autonomous variables

REC	Days of account receivables	=Account Receivables /[Net Sales /365]
PYT	Days of account payables	=Account payables/[Cost of Goods sold/365]
INVT	Days of inventories	=Inventories/[Cost of Goods sold/365]
GDP	Gross domestic products	=Annual GDP in purchase value
INFINT	Inflation	=Annual inflation rate(CPI at 2004)
SIZE	Interest Rate	=Bank of Ghana's policy rate
SALE	Total Asset	=Logarithm of Total Asset
	Annual sales	=Cash Sales + Credit sales-VAT

The Control Variables

WCP	Net Working Capital	=Current Asset-Current liability
Growth	Sales Growth	= Sales1- Sales0 / Sales0
DEBT	Leverage	=Total Debt / Total Assets
CCC	Cash Conversion Cycle	= ACR + INVT – ACP

The Independent Variables

GOPM	The gross operating profit margin before depreciation and amortization over total assets minus fixed assets	= (Sales – Cost of Goods Sold) / [Total Assets – Fixed Assets]
ROA	The return on assets	= GOP / Total Assets
CRT	Current Ratio	=Current Assets / Current Liabilities
RTERN	Retain Earnings	=Net Income- Expenses-Interest &tax
EBIT	Earnings before interest and tax	Sales- production cost- cost of sales

$$FDS = FinancialDistress = 3.3\frac{EBIT}{Total\ Asset} + 1.2\frac{Net\ working\ capital}{Total\ Asset} + 1.0\frac{Sales}{Total\ Asset} +$$

$$0.6\frac{Market\ Value\ of\ equity}{...Book\ value\ of\ debt} + 0.4\frac{Accomulated\ Retained\ earnings}{Total\ Asset}$$

Source of FDS: Ross.A.Westerfield R. W., Jaffe J.(2010) Corporate finance -

9th ed. (The McGraw-Hill/Irwin series in finance, insurance and real estate).

The proxied variables are based on the internal structure (income statement and balance sheet) of manufacturing firms in Ghana and other external microeconomic factors that have impact on firms' working capital. The table 3 below shows the internal structure of working capital of a typical manufacturing firm in Ghana:

Table 3. The Internal Structure of Working Capital

Current Liabilities	Current Assets
Bank Overdraft	Cash and Bank Balance
Creditors	Inventories:
	Raw-Materials
	Work-in-progress
	Finished Goods
Outstanding Expenses	Spare Parts
Bills Payable	Accounts Receivables
Short-term Loans	Bills Receivables
Proposed Dividends	Accrued Income
Provision for Taxation,	Prepaid Expenses
	Short-term Investments

Source: CFA, 2015

In order to achieve the above research objectives the following relationship worth discussing: Information gathered on the above companies wasanalyzed using panel data approach. According to Brooks, (2008) panel methodology presents benefits: (i) give access to more information by combining time-series and cross-sectional, allowing to address more complex issues that would not be possible with time-series or cross-sectional data. (ii) allows the use of a large number of observations, ensuring the asymptotic properties of estimators and increases the degrees of freedom, meaning more robust and meaningful t and F Statistic tests; (iii) reduces risk of Multi-colinearity, since

the data between entities have different structures; (iv) increases efficiency and stability of estimators by conducting adequate regression methods allowing a safer choice between different methods. Panel data also allows controlling for unobserved cross-section heterogeneity, making possible to exclude bias derived from the existence of individual effects. That is possible because it confines the heterogeneity to the intercept term of the relationship (Baum, 2006).

Model Specification

The major dependent variables as performance indicator used is financial distress level (FDS). The major internal determinants (independent variables) were leverage, size, profitability, cost of sales, return on asset and Growth status which have been proxied by selected ratios in the Table 1 above. The macroeconomic variables used as external independent variables are GDP in purchase value, average annual Inflation rates, policy interest rate, exchange rate and market value of equity of the selected firms.

In this study, the following reference point models were used based on the objectives of this research which include:

i)   Model 1   Financial distress Model

$$Z = 3.3 \frac{EBIT}{Total\ Asset} + 1.2 \frac{Net\ working\ capital}{Total\ Asset} + 1.0 \frac{Sales}{Total\ Asset} +$$

$$.6 \frac{Market\ Value\ of\ equity}{...Book\ value\ of\ debt} + 1.4 \frac{Accomulated\ Retained\ earnings}{Total\ Asset}$$

ii)   Model 2   Internal determinants of working capital Model

$$INTWCP_{it} = C_0 + C_1 grwth_{it} + C_2 ccc_{it} + C_3 ROA_{it} + C_4 size_{it} + + C_5 lev_{it}$$
$$+ C_6 CRT_{it} + C_7 Cossales_{it} + \mu_{it}$$

iii)   Model 3   External determinants of working capital model

$$EXTWCP_{it} = C_0 + C_1 GDP_{it} + C_2 INFL_{it} + C_3 EXR_{it} - C_4 INTR_{it}$$
$$+ C_5 MKTVE_{it} + \mu_{it}$$

iv)   Model 4   Working capital components Model

$$WCPC_{it=} C_0 + C_1 Dinvt_{it} + C_2 DREC_{it} + C_3 DPYT_{it} + C_4 CAS_{it-} C_5 CAL_{it}$$
$$+ \mu_{it}$$

Each model above achieves a specific research objective as follows:

1. Measuring financial distress level of the selected firms

The first model as modified below is used in this research to measure the financial distress level of all the ten selected firms.

$$FDS = \left[1.79 \frac{EBIT}{Total\ Asset} + 0.29 \frac{Net\ working\ capital}{Total\ Asset} + 0.01 \frac{Sales}{Total\ Asset} + \right.$$

$$0.27 \frac{Market\ Value\ of\ equity}{Book\ value\ of\ debt} + 1.39 \frac{Acomulated\ Retained\ earnings}{Total\ Asset} -$$

$$\left. 0.03 \frac{Current\ Asset}{Current\ Liability} \right] \Big/ \left[LOG \left[\frac{(-0.32*GDP - 0.3*EXR - 1.79*INFL + 2.97*INTR + 2.40*MKVE)}{5} \right] \right]$$

The immediate above equation is modified version of Altman and Ohson (2005) financial Distress model for predicting manufacturing companies

bankruptcylevel: $$Z = 3.3 \frac{EBIT}{Total\ Asset} + 1.2 \frac{Net\ working\ capital}{Total\ Asset} +$$

$$1.0 \frac{Sales}{Total\ Asset} + \quad .6 \frac{Market\ Value\ of\ equity}{...Book\ value\ of\ debt} + 1.4 \frac{Accomulated\ Retained\ earnings}{Total\ Asset}$$

See the appendix F below of how the new coefficients were genrated.

The Reasons why the above Financial Distress Model was Modified

Despite indications of worldwide convergence through globalization, international differences in legal requirements, accounting rules, lending practices, and managerial skill levels among countries have kept financial distress level from being measured with single model. Therefore, this study

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modified the Ohson's logic cumulative function and Altman's financial distress model for the following reasons:

i. The Ohlson's logic cumulative distribution function included only General Price Level Index as the only microeconomic factor that influence financial distress levels of firms he studied and based on European economies.

ii. Altman's model based on American economy and does not take into consideration the external economic variables or external determinants of working capital such GDP, Exchange rate, interest rate, inflation rate and taxation which have influence on financial distress. Therefore this study introduced a new variable into the Altman's model which is called the mean external effect include: GDP plus exchange rate plus interest rate plus inflation rate divided by the number of observations (EXMEFFECT).

iii. The constants of the Ohlson and Altman models are not applicable to Ghanaian situation as their concept is purely based on American-European economies. Therefore the coefficients of Altman's model such as 3.3, 1.2, 1.0, 0.6 and 1.4 were too high for Ghanaian economy so they were reviewed downwards as 1.79, 0.30, 0.01, 0.269 and 1.39 respectfully using financial data of Ghanaian firms to reflect the economic status of Ghana. How the coefficients of the model were reviewed is illustrated in the table in appendix G below.

iv. Also the mean Z score value of the Altman's model which categorises firms as financially distressed firms or financially healthy were reviewed to determine a benchmark for measuring financial distress level of

manufacturing firms in Ghana based on Ghanaian situation and economic circumstances. I therefore developed a range using the financial statement of the Ghanaian firms and assigned value from zero to two (0-2) based on parameters such as asset to debt ratio, returns on asset, and expenses to sales ratio in order to determine the coefficients of the above modified financial distress model and then find a range for comparing as follows:

a) If a firm has negative EBITDA or EBIT and Current liability exceeds current asset in particular financial year assign zero = 0

b) If a firm has negative EBITDA or EBIT but Current asset exceeds current liability in particular financial year. Or positive EBITDA or EBIT but current liability exceed current asset assign one = 1

c) If a firm has positive EBITDA or EBIT and Current asset exceeds current liability in particular financial year assign two = 2

Based on the above propositions a cumulative logistic function is formulated as follows: $f(A) = \dfrac{1}{1+e^{-a}} = I\,\dfrac{1}{1+e^{-(y0+y1X1+\cdots+ynXn}}$

Where A is a linear combination of the independent variables, $y0$ is a constant, $y1$ represents coefficients, and xi is independent variables. Then a method of maximum likelihood is then applied using the Eview software to estimate the coefficient of the modified financial distress model as illustrated in the table in Appendix G below:

d) Then I find the mean of the range as follows:

$$\bar{x} = \frac{\sum_{1=0}^{n} x + x_1 + x_2 + x_3 + \cdots \ldots \ldots x_n}{n}$$

$$\bar{x} = \frac{112}{100} = 1.12$$

Thus using the range from zero (0) to two (2):

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Hence: If A: 1.12 ≤ A ≥ 2 "Safe" Zone; the company is in a non-bankruptcy zone, it is financially healthy;

If A: 0.5 ≤ A ≥ 1 "Grey" Zone; the company should be on alert and exercise caution on fiscal health; and

If A: A < 0.5 -"Distress" Zone; the company is in financial distress, probability of bankruptcy is very high. Note that the lower the A-score value the more the firm becomes financially distressed.

e) After I have determined the above financial distress levels the following regressive relationships could then be established:

1. **The relationship between financial distress level (FDS) and internal working capital determinants (INTWCP).**

$$FDS_{it} = C_0 + C_1 grwth_{it} + C_2 ccc_{it} + C_3 ROA_{it} + C_4 size_{it} + C_5 lev_{it}$$
$$+ C_6 CRT_{it} + C_7 Cosales_{it} + \mu_{it}$$

Here, we want to find out if there is a relationship between financial distress level (FDS) and the internal working capital determinants (INTWCP).

$$INTWCP_{it} = C_0 + C_1 grwth_{it} + C_2 ccc_{it} + C_3 ROA_{it} + C_4 size_{it} + + C_5 lev_{it}$$
$$+ C_6 CRT_{it} + C_7 Cossales_{it} + \mu_{it}$$

Hence: INTWCP= internal determinants of working capital

$C_{0=}$ Proportionality constant

Growth=growth as a change in sales

CCC= cash conversion cycle as Receivables +Inventory- Payables

ROA= log of Gross operating profit/total asset

SIZE= log of total asset

Lev=leverage as a log of debt to asset ratio

Cossales= log of cost of sales

μ= error term

it= Number of companies under study over time

2. **Relationship between the Financial Distress level (FDS) and external determinants of working capital (EXTWCP).**

$$FDS_{it} = C_0 + C_1 GDP_{it} + C_2 INFL_{it} + C_3 \text{EXR}_{it} - C_4 \text{INTR}_{it}$$
$$+ C_5 MKTVE_{it} + \mu_{it}$$

Here, we want to find out if there is a relationship between the Financial Distress level (FDS) and external determinants of working capital.

$$EXTWCP_{it} = C_0 + C_1 GDP_{it} + C_2 INFL_{it} + C_3 \text{EXR}_{it} - C_4 \text{INTR}_{it}$$
$$+ C_5 MKTVE_{it} + \mu_{it}$$

Hence: Where EXTWCP= External determinants of working capital

C_0= Constant

GDP= Log of Gross domestic Product in purchase value from 2004-2013

INFL= Log of inflation rate

EXR= log of exchange rate between dollar and Ghana cedis

INTR= log of Average interest rate 2004-2013

MKTVE= log of stated operating capital

3. **The relationship between Financial Distress level (FDS) and working capital components (WCPC)**

$$FDS_{it=} C_0 + C_1 invt_{it} + C_2 REC_{it} + C_3 PYT_{it} + C_4 CAS_{it-} C_5 CAL_{it} + \mu_{it}$$

Here, we want to find out if there is a relationship between Financial Distress level (FDS) and working capital components (NWCP)

$$WCP_{it=} C_0 + C_1 invt_{it} + C_2 REC_{it} + C_3 PYT_{it} + C_4 CAS_{it-} C_5 CAL_{it} + \mu_{it}$$

Hence: Where WCPC = working capital component,

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invt = Days of inventory

REC= Days of Receivable

PYT= Days of Payables

CAS= Current asset,

CAL=Current liability

4. **The combined effect of internal, external and working capital components on financial distress level**

$$FDS_{it} = C_0 + C_1 grwth_{it} + C_2 ccc_{it} + C_3 ROA_{it} + C_4 size_{it} +$$

$$C_5 lev_{it} + C_6 CRT_{it} + C_7 Cossales_{it} + C_8 GDP_{it} + C_9 INFL_{it} +$$

$$C_{10} EXR_{it} - C_{11} INTR_{it} + C_{12} MKTVE_{it} + C_{13} Dinvt_{it} + C_{14} DREC_{it} +$$

$$C_{15} DPYT_{it} + C_{17} CAS_{it-} C_{18} CAL_{it} + \mu_{it} .$$

Where $C_1, C_2, C_3, C_4 \ldots \ldots C_{18}$ measures the sensitivity of the FDS to respective variable indicators.

Here, we want to find out the overall effect of internal, external and working capital components of the determinants of working capital on financial distress level of the selected firms substituting model one, two and three into the model four equation above we get the final model five as follows:

$$FDS = C_0 + C_1 INTWCP_{it} + C_2 EXTWCP_{it} + C_3 NWCP_{it} + \mu_{it}$$

Where FDS= financial distress firm

Each equation above represents the following hypothesis which shall be tested in the subsequent chapters:

H_1. There is no significant relationship between the internal determinants of working capital and financial distress level of the listed accepted firm

H_2. There is no significant relationship between the external determinants of working capital and financial distress level of the listed accepted firms

H$_3$. Change in net working capital component has no effect on financial distress level

H$_4$.Change in the external and internal determinants has no effect on financial distress level.

H$_5$. Growth, profitability, return on asset and liquidity other external factors have no relationship with financial distress levels.

Financial Distress Model Assumptions:

The following diagnostic tests were carried out to ensure that the data suits the basic assumptions of classical linear regression model:

Normality: To check for normality, histogram normality test in the appendix F below were used. Kurtosis and Skewness of the distribution of the data were examined. And it shows that the data is normally distributed.

Muliticollinearity: The existence of strong correlation between the independent variables was tested using correlation coefficient.

Unit root test: All variables of interest were tested for unit root using the ADF - Fisher Chi-square hypothesis (see appendix F below). All variables assumed asymptotic normality which shows that the data contains no unit root at 5% significant level.

Heteroscedasticity: To deal with the problem of heteroscedasticity of disturbance terms, cross section weight standard error and variances corrections were employed in establishing the relationships.

Sources of Data

Annual reports of the listed manufacturing companies were gathered from the Ghana Stock Exchange database. For the purpose of authenticity only independent certified financial statement were used for this analysis. In

addition, figures for GDP, Exchange rate, Inflation, Interest rate were obtained from Ghana Statistical Service and Bank of Ghana annual statistical bulletin respectively. The figures were further cross-checked with related data from International Monetary Fund, 2013 World Economic Outlook and 2013 CIA world Fact book through the internet. Some inconsistencies were found among these sources and for political reasons figures from IMF were used for analysis.

Data Analysis

The study used ratios and multiple regressions and panel least square estimates to establish relationships among working capital determinants such as liquidity, profitability and financial distress levels by using factors that influence the working capital. The quantitative data analyses has been adopted by using Eview statistic program in order to examine the relationship between company internal and the external factors as a measure of working capital management. The statistics included in our study are as follows;

The data collected from the secondary sources using data collection sheet were edited, coded and cleaned. Then the data was analysed using Microsoft Excel and economic views software. The estimation and identification of panel data models requires prior tests to identify the correct method. Such method implies firstly to analyse data considering Pooled Ordinary Least Squares (OLS) estimation, in order to test for unobserved heterogeneity effects across firms.

Panel Least Square estimation provides an F-statistic test under a null hypothesis that the constant terms are equal across entities. If the null hypothesis is rejected there are unidentified individual effects that have to be

properly treated. There are several techniques to analyse panel data, such as Fixed Effects (FE) and Random Effects (RE) . I choose Ramsey test and Cumulative Sum of Squares (cusum) methodology to examine whether the unobserved heterogeneity term is correlated with explanatory variables, while continuing to assume that regressors are uncorrelated with the disturbance term in each period. The null hypothesis for this test is that unobserved heterogeneity term is not correlated with the independent variables. That is the working capital determinants do not have direct influence on firms financial distress. The null hypothesis is rejected then I employed Fixed Effects (FE) methodology in finding relationships between variables.

Correlation analysis

Correlation is used to measure the direction of linear relationship between two variables as well as to measure the strength of association between variables (Tabachnick & Fidell, 2007, p. 56-57). In this study, the Pearson's Correlation Coefficient is calculated to see the relationship between all variables. As for the direction of the relationship, the positive correlation indicates that when one variable increase another also increases while the negative correlation show inverse relationship (Pallant, 2007, p. 101).

Regression analysis

In order to investigate the relationship between working capital determinants and the financial distress level, standard multiple regression is used to test hypotheses.There are two types of hypothesis in quantitative research: null hypothesis and alternative hypothesis. Hypotheses, which are proposed earlier in chapter 3 under Theoretical framework and literature review, are alternative hypotheses where the expected relationship between

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factors and the financial distress have been stated while the null hypotheses are the opposite. I use the significant level at 0.05 to decide whether or not to drop or accept null hypothesis which give us 95% confidence level. If the probability-value is less than or equal to the 0.05 significant level, null hypothesis will be rejected and will conclude the alternative hypothesis is true. If the probability-value is greater than the 0.05 significant level, I fail to reject the null hypothesis and conclude that the null hypothesis is plausible.

The regression models formulated to examine the relationship between financial distress and working capital management represented by FDS (financial distress). Return on asset, cash conversion cycle, current ratio, change annual sales, log of total asset and log of long term borrowing to asset have been substituted for profitability, liquidity, growth and size of the manufacturing firms in the financial distress (FDS) model to investigate the relationship between the internal determinants of working capital and financial distress level. In addition, GDP, exchange rate, inflation and interest rate helped me to investigate the relationship between external determinants and financial distress levels of the listed manufacturing companies in Ghana.

Application of the Modified Financial Distress Model to Ghanaian manufacturing companies

An investor who is attempting to increase the line of credit with a typical Ghanaian manufacturing company can apply the above model to determine whether the firm one intends to invest in is financially distress or not. The investor uses the A-score model to determine creditworthiness of the firm before investing. Financial distress level of the company can be determined to predict probability of default, if GDP, inflation rate, exchange rate and interest

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rate of Ghana are known and the balance sheet and income statement of the company are given.The illustration in the appendix H below explains how the model can be used to predict financial distress level.

Credibility criteria

Reliability

The reliability criterion evaluates how careful a study has been conducted regarding the selection of data and choices made of which methods to use when measuring the data. A high level of reliability is achieved when repeatedly measurements of the same data, using the same methods to measure, gives the same or almost the same results. A high reliability indicate that the choices and selections made are appropriate for the study in terms of fulfilling the purpose of the study (Jacobsen, 2007, p. 13)

The data for this study have been collected from companies' annual reports from the year 2004 and 2013. The data consist of figures taken from the financial statements. As listed companies in Ghana, companies are been required to prepare their financial statement to follow International Financial Reporting Standards (IFRS) which strengthen the reliability aspect of the contents in these annual reports and so the reliability of the data. The choice of data has a high reliability since the figures in the annual reports that have been used are consistent and will never change over periods according to regulations.

Possible occurrences that can have a negative effect on the reliability are for example typos of the data that could occur when collecting and retyping the data and this could lead to misleading results. I have both double-checked the figures in the data collection which increases the reliability for a reliable

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set of data. Another thing to consider is, that despite the fact that auditors have examined and approved these annual reports, it cannot be excluded that some figures may be misleading to some extent as companies, in an attempt to look better for business, may have aggrandize their figures. This is something I cannot control or know for sure but I am aware of the possibility.

What should be kept in mind, regarding the reliability of the result over other time periods, is that in this study I have used data from a period of time affected by a financial crisis which has influenced the results. This current financial crisis has affected most companies very negatively and as financial crises differ in extent this result is reliable to some extent as the result most likely would differ if the study was to be replicated during another crisis. Apart from the financial crisis, another factor to consider in a replication ahead of this study that could affect the reliability over time and the result is the set of companies included in the study which most likely will differ, despite the same selection, as new companies come to and others disappear.

Validity

Bryman and Bell (2005, p. 597) refers to validity as "a measure of how well a specific measurement of a concept, really gives an accurate picture of the concept". In this study I aim at examining the association between company financial distress level and working capital management measured by financial ratios and regression equations. The data consist of figures collected from companies' annual reports so there is no risk for misinterpretation of the numbers. The figures were converted into nearest thousands according to the ratios and equations which are well-known concept

which strengthen the validity that the components give an accurate picture of the concept.

Generalisability

The level of generalisability determines how well a result can be applied to another and larger population or context (Bryman& Bell, 2008, p. 156). Because I have chosen to exclude banks and other financial institutions from my sample this study and its result should not be seen as representation for all the industries but only to the industries included in the sample which is in the manufacturing industry. As I do not have as big sample as would be desirable for a satisfying generalisability of my result, I believe the result should be generalized with some consideration. A larger sample could be an alternative to strengthen the generalisability.

Another thing to consider is if the results are generalisable to other surroundings than the surrounding that the study was conducted in. This study includes Ghanaian listed companies which is a circumstance that has affected the result. If the same study would include Italian listed companies instead of Ghanaian companies the distribution of companies in each industry would look different as well as the result due to the different set-up of companies between countries. This aspect, together with the special circumstance that this study was conducted during a recession which countries reacted differently to, make it problematic to generalize these results to other countries which we do not recommend. A careful generalisability of the results could be made to companies in West African countries as they operate under the same circumstances as the companies in this sample.

Replication

The replication criterion has to do with how easy it is to carry out the same study over again (Bryman& Bell, 2005, p. 48). To make a replication of this study possible, I have tried to explain my approach of the study as thoroughly as possible. A replication of this study should be fairly easy as I have used data from annual reports that will not change over time, and applied statistics as method. If others in the future would use the exact same data, from the same periods and companies and perform the same tests with the same methods that I have used, the result should be the same or close to the same with consideration to typos.

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CHAPTER FOUR

RESULTS AND DISCUSSION

An Overview

In this chapter, I present empirical results from quantitative data analysis using panel least square estimates with help of eview software. I started by presenting results from descriptive statistics, correlation matrix analysis and finally regression analysis. The aim of the descriptive statistics is to help to find the average changes in the variables under study and their effect on financial distress. The correlation matrix is to help to test the hypothesis that there is no relationship between working capital determinants (profitability, liquidity, growth, sizes and other economic variables) and financial distress level of listed manufacturing firms. The regression analysis intend to establish relationship between working capital determinants as independent variables such as the returns on assets, current ratio and the financial distressed level of the listed manufacturing companies in Ghana.

Descriptive statistics

In this study the descriptive statistics include the financial distress analysis, internal determinants, external determinants, and working capital components as presented below: Table 4 below presents the values over the ten years from 2004 and 2013 and this is for a comparison of financial distress level of the firms over the ten years. Considering each year and starting with the mean, it can be noted that there has been some changes in the values over the years from 2004 to 2013 in the table below:

Table 4. Descriptive statistics for financial distress

YEAR	Mean	Max	Min.	Std. Dev.	Obs.
2004	2.489927	6.761632	-0.578124	2.411257	10
2005	2.013269	6.115529	0.255174	1.879279	10
2006	1.465035	5.148895	0.227435	1.433072	10
2007	1.043380	2.747576	-0.292816	1.007071	10
2008	0.894810	3.367336	-1.657428	1.383449	10
2009	0.940701	3.530643	-2.207449	1.740982	10
2010	0.608082	2.520314	-1.549768	1.110643	10
2011	1.268640	2.876921	0.055650	0.999097	10
2012	0.432861	2.578080	-1.150444	1.100270	10
2013	0.769166	3.371206	-0.463377	1.194197	10
All	1.192587	6.761632	-2.207449	1.547677	100

Source; Author's own estimate, 2015

Comparing the mean values from the Table 4, with the critical A-score value of 1.12 obtained from the mean of the modified financial distress model above, the mean of the financial distress levels have been fluctuating over the years. It can also be noted that average financial distress levels of the manufacturing firms were very healthy in the year 2004 and 2005 with average distressed levels of 2.489927 and 2.013269 respectively. However, it started deteriorating in 2007 with mean value of 1.043380 which is below the critical value of 1.12 and assume further decline in value until it rises again in 2011 to show the undulating behaviour of the financial distress level in the manufacturing sector in Ghana.With 2012 recording the worse or minimum distress level of = 0.043380 when compared with the average critical A-value of = 1.12, which shows a gray" Zone; the companies are near financial distress and the probability of bankruptcy is very high in year 2012. While the worsened financial distress level improve its value marginally to 0.769166, in the year 2013. Comparing the components of the standard deviation from

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2004 to 2013, in the table 6 above, the values have been unstable over the years. This shows that business environment in the manufacturing sector in Ghana is very turbulent making it difficult to predict the amount of risk that an investor will assume when investing in that sector. In the Table 4 above, firms assumed highest risk in the year 2010 and 2012 with standard deviation values. = 3.26878 and 2.08000 respectively as compared to the rest of the years. The increased level of risk in the year 2010 and 2012 can be attributed to rising cost in the energy sector in Ghana which in turn affects cost of production. When comparing the maximum level of financial distress over the ten year period, manufacturing firms became most distress in the year 2010 with the maximum value = 9.9867 as compared to other years. This situation may be attributed to world economic credit crunch which impacted negatively on working capital of many firmsin countries around the globe.

The next issue is to find out if there is a relationship between the internal determinants and financial distress level (FDS) as indicated in the table below.

Table 5. Descriptive statistics for internal Determinants of Working Capital

	MFDS	GROWTH	CCCR	ROA	SIZE	LEV	CRT	COSALES
Mean	1.192	3.39	391.43	9.93	5.62	0.61	10.03	496958
Median	0.82	0.13	155.18	5.69	5.69	0.51	1.44	97468
Maximum	6.76	290.46	4925.78	79.93	7.59	6.18	98.43	27316
Minimum	-2.21	-0.97	-3978.01	-1.47	3.38	0.01	0.06	81100
Std. Dev.	1.54	29.18	1190.26	15.03	1.17	0.76	17.48	726047
Skewness	1.10	9.67	-0.03	2.051	-0.23	4.38	2.97	1.5483
Kurtosis	4.93	95.60	7.59	7.53	2.06	30.24	12.75	4.0619
Jarque-B	35.94	37289	87.95	155.60	5.07	3411.56	543.80	44.65
Probabil	1.00	1.00	0.00	0	0.08	0.00	0.00	0.00
Sum	119.28	339.70	39142	992.84	562.11	61.58	1003.1	49695
Sq. Dev.	237.15	84288	14025	22374	136.02	57.72	30270	52187
Observ	100	100	100	100	100	100	100	100

Source; Author's own estimate, 2015

The continuous variables in the Table 5 allow us to analyze quantitative data by using descriptive statistics. Descriptive statistics show characteristics of sample which include mean value, minimum, maximum and standard deviation, jarque-bera statistics and its probabilities. From Table 5 above, the mean financial distress level in the manufacturing industry in Ghana is 1.192. This shows that manufacturing sector in Ghana are slightly above average and it shows that they are in safe zone and have greater chance of escaping from financial distressed over the ten year period between 2004 and 2013 under this study.

The average growth rate in the entire manufacturing industry in Ghana is approximately 3.4% per annum and grew by 340% (3.40x100 =340%) over the ten year period. This indicates that each manufacturing firm in Ghana have annual growth rate of 2.840% [(340/(12months x10 firms)] per annum. The mean of returns on asset in the manufacturing industry in Ghana over the period under the study is 9.93% per annum. This makes investment in the manufacturing industry unattractive because the risk- free rate of 22% per annum between 2004 and 2013 of government of Ghana's bond is higher than the average returns on asset during the period under study. This lower return in the manufacturing industry is largely attributed to erratic power supply and high cost of production in Ghana between 2003 and 2014 periods.

In addition, the third research objective requires the need to establish relationship between external determinantsand financial distress as indicated in the table below:

Table 6. Descriptive statistics for External Determinants

	MFDS	GDP	INFL	EXR	INTR	MKTVE
Mean	1.19258	4.63876	1.07484	0.11913	1.17138	4.81869
Median	0.82075	4.56345	1.04137	0.11141	1.168229	4.72699
Maximum	6.76163	5.92827	1.29225	0.45024	1.267174	6.42954
Minimum	-2.20744	4.28512	0.93951	-0.05060	1.07915	3.04493
Std. Dev.	1.54767	0.37735	0.11729	0.15540	0.06419	0.92830
Skewness	1.10320	1.47251	0.46705	0.74489	0.09417	0.08084
Kurtosis	4.93840	5.07502	1.9769	2.61023	1.58772	2.11117
Jarque-Bera	35.9401	54.0787	7.9963	9.88082	8.4583	3.40065
Probability	1.00.	1.00	0.01834	0.00715	0.0145	0.18262
Sum	119.258	463.876	107.4840	11.91332	117.1384	481.869
Sq. Dev.	237.135	14.0973	1.36205	2.39097	0.40802	85.3134
Observation	100	100	100	100	100	100

Source; Author's own estimate, 2015

From then Table 6, it can be noted that the average annual positive impact of GDP on the financial distress level (FDS) in the manufacturing sector of Ghana is 4.638 per annum and over the entire period of ten years is approximately (4.638 x 10) 463.876%. This positive impact has been negatively eroded away by the increase in the rate of inflation (INFL), 1.0748, the interest rate (INTR) 1.1714 and exchange rate (EXR) depreciation of 1.1913 which are around 107.48%, 117.14% and 11.9% respectively over the ten year period. And it shows that while GDP is positively impacting on the manufacturing sector by 4.648% per annum, increase in inflation rate, interest rate and depreciation of the cedi have also eroded it by cumulatively 2.364% (1.074+1.171+0.119) per annum. Leaving thenet positive GDP growth impact in the manufacturing sector by only 2.184% (4.648-2.364) per annum.

Furthermore, when working capital component changes it effect on financial distress is determined in the table below:

Table 7. Descriptive statistics for working capital component

	MFDS	INVT	RECIEV	PAYT	CAS	CAL
Mean	1.19258	272667	503945	647127	117261	301861
Median	0.82075	101307	33386	84783	214812	37121
Maximum	6.76163	181166	67049	689586	820386	335585
Minimum	-2.20744	1000	1000	1178	1222	1339
Std. Dev.	1.54767	372145	138686	138959	190691	575981
Skewness	1.10320	1.92402	3.3870	3.07397	2.0919	3.16718
Kurtosis	4.9384	7.07172	13.3609	12.0375	6.7992	14.2853
Jarque-Bera	35.9401	130.776	638.488	497.804	133.081	697.845
Probability	1.000	0.000	0.000	0.000	0.000	0.000
Sum	119.2587	2726676	503945	647128	117269	301861
Sum Sq. Dev.	237.135	1371071	190416	191147	359903	328437
Observations	100	100	100	100	100	100

Source; Author's own estimate, 2015

From Table 7, the average current liability (CAL) of the selected firms exceeded their average current asset (CAS) by GH₡184,600 (GH₡301861-GH₡117261) over the ten year period. And it shows that most of the selected firms are operating on credit from suppliers and banks during the period under review. Comparing the average days of account payables (DPYT) =647127 and days of account receivables (DREC) =503945 we can say that manufacturing firms in Ghana pay their creditors 39.23 days [(647127-503945)/(365 days x 10)] faster than they collect cash from their customers. Also, manufacturing firms in Ghana turn over their inventory 74.70 times [272667/ (365 days x 10)] in a year.That is, it takes 74.70 days to buy raw materials from suppliers, turn them into finished goods and sell them to customers and collect cash.

Correlation Analysis

The correlation matrix table enables us to determine the kind of relationship that exists between financial distress level as a dependent variable and the rest of independent variables in order to answer the above research questions. It shows whether the relationship is strong, moderate or weak based on the coefficient of each variable.The first question is: What is the correlation between the internal determinants of working capital and financial distress level of the selected firms? This question can be answered by running correlation regression to find the relationship between the variables as indicated in the table below:

Table 8. Correlation Matrix between FDS and internal determinants

	MFDS	GROWTH	CCC	ROA	SIZE	LEV	CRT	COSALES
MFDS	1.000	-0.0847	-0.0173	0.3664	0.2633	0.70479	-0.0719	-0.3036
GROWTH	-0.0847	1.000	0.0007	0.1675	0.0950	0.0044	0.1506	-0.0635
CCC	-0.0176	0.0007	1.000	-0.0125	0.3237	0.0783	-0.0431	0.2330
ROA	0.3664	0.1675	-0.0125	1.000	0.4915	0.2610	0.0968	-0.2672
SIZE	0.2633	0.0950	0.3237	0.4915	1.000	0.3651	0.2820	0.1359
LEV	0.7047	0.0044	0.0783	0.2610	0.3651	1.000	0.0005	-0.1081
CRT	-0.0714	0.1506	-0.0431	0.0968	0.2820	0.0005	1.000	-0.0509
COSALES	-0.3036	-0.0635	0.2330	-0.2679	0.1359	-0.1081	-0.0509	1.000

Author's own estimate, 2015

The immediate correlation matrix Table 8 above, indicates that the financial distress level (FDS) has a negative correlation with the sales growth (GROWTH) and it shows that as sales is increasing financial distress go down. However such relationship between growth and financial distress is weak with correlation coefficient of -0.0847. On the other hand there is weak positive correlation between Return on Asset (ROA) and the financial distress

level (FDS) with correlation coefficient of 0.3664. This shows that the higher the returns on asset the higher the risk of becoming financially distressed.

However FDS shows a weak negative correlation with cash conversion cycle (CCC) at coefficient of -0.0173. And it shows that as firms keep on increasing the ability to turn over inventories into cash, financial distress levels go down which indicates that firms' financial performance improve for better. Meanwhile, the value of correlation coefficient which is used to determine the strength of the relationship suggests weak negative relationships between the financial distress and these two variables, cost of sales (COSALES) and current ratio (CRT) with the coefficient value of -0.3036 and -0.0719, respectively. Regarding the correlation coefficient between financial distress level and leverage (LEV) which is asset to debt ratio, it flows with the strong positive correlation $r = 0.70479$. And it shows that as firms increasing borrowing to finance their asset they become more and more financially distress. Also, size (SIZE) showed a weak positive correlation with financial distress at coefficient value of 0.2633. And it shows that all things being equal as firms increase in size, they become more and more susceptible to financial distress

The next question is: What is the correlation between the external determinants of working capital and financial distress level of the selected firms? This relationship can be identified with the Table 9 below:

Table 9. Correlation Matrix between FDS and external determinants

	MFDS	GDP	INFL	EXR	INTR	MKTVE
MFDS	1.000	-0.29914	0.12235	-0.26512	0.1560	-0.01287
LGDP	-0.2991	1.000	-0.3176	0.6197	-0.2346	0.1911
LINFL	0.1223	-0.31760	1.000	-0.29199	0.7928	-0.0802
LEXR	-0.26512	0.6197	-0.2919	1.000	-0.1131	0.0371
LINTR	0.15606	-0.23468	0.7928	-0.1131	1.000	-0.0809
LMKTVE	-0.012872	0.19110	-0.08028	0.0371	-0.0809	1.000

From Table 9, it can be noted that there is a negative correlation between gross domestic product (GDP) and financial distress level (FDS) with the correlation coefficient r = -0.2991. And it shows that when GDP increase it growth rate financial distress level of the firms go down and vice versa. However, inflation rate (INFL) shows a positive correlation with financial distress at coefficient value of 0.12235. And it shows that when general price levels increases financial distress level also increases among firms. Exchange rate (EXR), on the other hand showed a negative correlation with the financial distress level with the correlation coefficient r = -0.26512. This shows that, when the value of a country's currency falls among its major trading partners, financial distress increases among firms that either import their raw materials or export their finished goods to those countries.

In addition to these, it can be noted from Table 9 that interest rate (INTR) showed a positive correlation with financial distress level (FDS) at coefficient value of 0.1560. This presupposes that when interest rate increases, financial distress level also increases among firms. This is because access to credit becomes more expensive which in turn affect the ability of the firms to raise more working capital. Moreover, market value of equity (MKTVE)

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showed a negative correlation with financial distress. Which means that firms becomes more financially distress if value of its shares fall on the market due to lack of buyers making it more difficult to raise working capital.

Another question is: What is the correlation between the working capital components and financial distress level of the selected firms?

The Table 10 below explains that relationship between financial distress and working capital components.

Table 10. Correlation Matrix between FDS and working capital component

	MFDS	INVT	RECIEV	PAYT	CAS	CAL
MFDS	1.000	-0.2535	-0.1412	-0.1823	0.0769	-0.1537
INVT	-0.2535	1.000	0.5873	0.1388	0.4137	0.2941
RECIEV	-0.1412	0.5873	1.000	-0.0150	0.1580	0.0460
PAYT	-0.1823	0.1388	-0.0150	1.000	0.5449	0.1640
CAS	0.0769	0.4137	0.1580	0.5449	1.000	0.1635
CAL	-0.1537	0.2941	0.0460	0.1640	0.1635	1.000

Source; Author's own estimate, 2015

Concerning the components of working capital, the Table 10 above, indicates that current asset (CAS) shows a positive correlation with financial distresslevel (FDS) and current liability (CAL) shows a negative correlations with the financial distress (FDS) with the correlation coefficient r = 0.0769 and -0.1537 respectively suggesting that the relationship is very weak. And it also shows that when the components of working such as current asset increases as a result of say firms pile-up inventories, having more work-in-progress and creating more receivables without collecting cash on time, financial distress increases among the firms.

However, when current liability increases financial distress decreases because the trade creditors might have given the firms enough time to trade

with what they borrowed. Also, number of days accounts receivable and number of days account payable shows a negative correlation with FDS with the correlation coefficient r = -0.1412 and -0.1823 respectively. However, days of inventory shows a positive relationship with financial distress. This shows that all component of working capital have some influence on the firms' financial distress level in the manufacturing industry.

Regression Analysis for Models

In order to establish relationship between the working capital determinants and level of financial distress among manufacturing firms in Ghana there is the need to develop a number of regressive models and call them model one, two, three and four so that the research question can be answered as stated under chapter three.

The use of Determinants of Working Capital to Measure the Financial Distress Level

One of the models developed by Edward Altman (1993) uses financial statement ratios and multiple discriminates analyses to predict bankruptcy for publicly traded manufacturing firms. The resultant model is expressed as follows:

$$Z = 3.3 \frac{\text{EBIT}}{\text{Total Asset}} + 1.2 \frac{\text{Net working capital}}{\text{Total Asset}} + 1.0 \frac{\text{Sales}}{\text{Total Asset}} +$$

$$.6 \frac{\text{Market Value of equity}}{\text{...Book value of debt}} + 1.4 \frac{\text{Accomulated Retained earnings}}{\text{Total Asset}}$$

where Z is an index of bankruptcy.

A score of Z less than 2.675 indicates that a firm has a 95 percent chance of becoming bankrupt within one year. However, Altman's results show that in practice scores between 1.81 and 2.99 should be thought of as a gray area. In actual use, bankruptcy would be predicted if Z ≤ 1.81 and non-bankruptcy

if Z ≥ 2.99. Altman demonstrations that bankrupt firms and non-bankrupt firms have very different financial profiles within one year before bankruptcy. These different financial ratios are the key intuition behind the Z-score model. Using the mean financial distressed values of the selected manufacturing firms over a period of ten years in the table below and comparing them with the Professor Altman's Z-score model values we can predict the financial distress level of the selected firms in order of magnitude and advice individual stakeholders accordingly.

However, Altman's model is based on American economy and does not reflect the economic circumstances of Ghana. In order to ensure that this research work reflect the Ghanaian economy, Altman's financial model were reviewed and named as model one as follows as indicated in the methodology: Model 1:

$$\text{FDS} = \left[1.79 \frac{\text{EBIT}}{\text{Total Asset}} + 0.29 \frac{\text{Net working capital}}{\text{Total Asset}} + 0.01 \frac{\text{Sales}}{\text{Total Asset}} + \right.$$

$$0.27 \frac{\text{Market Value of equity}}{\text{Book value of debt}} + 1.39 \frac{\text{Accomulated Retained earnings}}{Total\ Asset} -$$

$$\left. 0.03 \frac{Current\ Asset}{Current\ Liability} \right] \Big/ \left[LOG \left[\frac{(-0.05*GDP-0.83*EXR-0.59*INFL+1.81*INTR+0.08*MKVE)}{5} \right] \right]$$

See the Research Methodology Section pages 75-79 of how and why this Model was deduced.

Also the Z- score values of Altman were reviewed and named as Actual critical value score (A- score) so as to distinguish it from the Z and to reflect economic status of Ghana as follows:

If 1.12 ≤A ≥ 2 "Safe" Zone; the company is in a non-bankruptcy zone, it is financially healthy;

If A: $0.5 \leq A \geq 1.12$ - "Grey" Zone; the company should be on alert and exercise caution on fiscal health; and

If A < 0.5 -"Distress" Zone; the company is in financial distress, probability of bankruptcy is very high. Note that the lower the A-score value the more the financially distressed of the firm.The regression result of the modified model is illustrated in the Table 11 below:

Table11. Financial Distress Measurement Table

COMPANY	Mean	Max	Min.	Std. Dev.	Obs.
Africa Chan	0.2849	0.6013	-0.0545	0.22061	10
Aluworks	1.2165	3.5306	-0.5781	1.26443	10
Benso	1.6741	3.3712	0.7064	0.79080	10
Camlot	1.7966	6.1155	-0.4633	2.60820	10
CocoaProc	0.7522	4.2943	-2.2074	2.36329	10
FanMilk	1.7231	2.9681	1.1564	0.61918	10
Guinness	1.7658	3.3673	-1.1504	1.25670	10
PoineerKit	0.1773	0.8077	-0.2311	0.29401	10
Starwin	0.8131	6.7616	-0.2331	2.11812	10
Unilever	1.7217	3.2087	-0.2091	1.03108	10
All	1.1925	6.7616	-2.2074	1.54767	100

Source; Author's own estimate, 2015

The critical categories used in this research to predict financial distress, based on   A- score model, are as follows:

1. If A: $1.12. \leq A \leq 2$ "Safe" Zone; the company is in a non-bankruptcy zone, it is financially healthy;

2. If A: $0.5 \leq A \leq 1.12$- "Grey" Zone; the company should be on alert and exercise caution on fiscal health; and

3. If A: $A < 0.5$ -"Distress" Zone; the company is in financial distress, probability of bankruptcy is very high. Note that the lower the A-score value

the more the financial distress of the firm. That is the company is in financial distress, probability of bankruptcy is very high.

From the Table 11 above, six out of the ten selected firms such as, Guiness Ghana limited, FanMilk Ghana limited, Benso Oil, Aluworks, and Unilever companies have mean A-score value of 1.7658,1.7231,1.6741,1.2165,1.7217 and 1.7217 respectively which are greater than the actual critical A-score value of A$\geq$ 1.12. And it shows that such firms were in safe zone and away from financial distress over the ten year period under this study. However, such firms which are far away from financial distress are also exposed to highest risk as can be seen from the standard deviation figures from Table 11.

However, two of the Companies such as Cocoa processing Company and Starwin Ltd found themselves in the gray zone with the mean financial distress level of 0.7522 and 0.8131 respectively. And it shows that these two companies should be on alert and exercise caution on fiscal health. Meanwhile, companies like African Champion limited and Pioneer Kitchen Company, showed the sign of bankruptcy with the A-score value =0.2849 and 0.1773 respectively which are less than 0.5 of the Actual critical A-score model value. This means African Champion and Pioneer Kitchen are in "Distress Zone"; the companies are in financial distress, probability of bankruptcy is very high and should be prepared to implement some of the recommendations of this research in the chapter five.

The overall mean score value of 1.1925 shows that the financial health of the manufacturing firms in Ghana is averge and more closer to Gray zone when compared with the crirtical A-score value of A: $1.12 \leq A \leq 2$- during the 2004 to 2013 periods of the study and shows that the companies in the

manufacturing sector should be on alert and exercise caution on fiscal health;. This uncertainty that firms in the manufacturing sector find themselves in Ghana, may be attributed to erratic power supply, rising cost of production and stiff competition with imported goods that have bedeviled the Ghanaian economy during the period of this research.

In order to make the analysis more authentic, I confirmed the financial distress status of the firms by physical examination of the EBIT and EBITDA in the comprehensive income statement as proposed by Platt and Platt (2006) that a firm is financially distressed only when it meets three of the conditions noted below. These three measures are:

1. Negative EBITDA interest coverage.

2. Negative EBIT.

3. Negative net income before special items.

 To be included as financially distressed a company needed to fail all the three tests in two consecutive years. Companies classified as not financially distressed did not meet any of the three criteria in the two consecutive years. See Appendix C of the comprehensive income statement extracted from annual report of some selected manufacturing firms in Ghana that have got negative EBIT in two consecutive years.

The relationship between the internal determinants of Working Capital and financial distress level

The Internal Working Capital Determinants include GROWTH (change in sales), LIQUIDITY [Cash Conversion Cycle (CCC)], PROFITABILITY [(return on asset (ROA)],SIZE (log of total asset), LEVERAGE[(log of long term debt to asset (LEV)] SOLVENCY[(current ratio (CRT)] and EXPEDITURE CONTROL[how much cost is incurred to realize an amount

of sales COSSALE)]. Model two below shows the relationship between the internal determinants of working capital and financial distress level in the Ghanaian manufacturing industry of the accepted firms.

Model 2:

$$FDS_{it} = C_0 + C_1 grwth_{it} + C_2 ccc_{it} + C_3 ROA_{it} + C_5 size_{it} + C_6 lev_{it}$$
$$+ C_7 CRT_{it} + C_8 Cosales_{it} + + \mu_{it}$$

When the index FDS is regressed against the rest of the variables it helps to determine how individual internal determinants influence the financial distress level in the manufacturing industry as indicated in the table below:

Table 12. Relationship between FDS and internal determinants

Variable	Coefficient	Std. Error	t-Statistic	Probability
C	1.85375	2.71923	0.68172	0.49731
GROWTH	-0.00503	0.00131	-3.81224	0.00026
ROA	0.02396	0.01153	2.07786	0.04081
SIZE	-0.03666	0.47489	-2.49835	0.03955
LEV	1.31896	0.19638	6.71631	2.16772
COSALES	-6.26057	2.86328	-2.18650	0.03159
CRT	7.02596	0.01599	4.00439	0.00650
CCC	-0.00213	0.00012	-3.07334	0.00862

		Effects Specification		
Cross-section fixed (dummy variables)				
R-squared	0.66674	Mean dependent var		1.1925
Adjusted R-squared	0.60250	S.D. dependent var		1.5476
S.E. of regression	0.97577	Akaike info criterion		2.9424
Sum squared resid	79.0270	Schwarz criterion		3.3853
Log likelihood	-130.1248	Hannan-Quinn criter.		3.1217
F-statistic	10.37854	Durbin-Watson stat		1.7987
Prob(F-statistic)	7.95311			

Source; Author's own estimate, 2015

Hypotheses test Results

First Hypothesis is to test that Growth has no significant relationship with financial distress levels of the selected firms. First hypothesis results proved that there is a significant relationship between Growth and financial distress level of the selected firms (companies) on Ghana stock exchange. According to Table 12 above, there is a significant relationship between GROWTH and FDS level of the selected firms with t-statistics = -3.81224 and probability value = 0.00026, it is so because the probability-value is less than 5 percent significant level which is the comparative value chosen for this study. The coefficient value = -0.00503 shows that there is a negative relationship between GROWTH and FDS. And it demonstrates that an increases or change in sales leads to a fall in financial distress levels or improvement in financial health of the selected manufacturing firms.

Second Hypothesis is to test if Profitability has no significant relationship with financial Distress. Second hypothesis results proved that there is a significant relationship between profitability and financial distress of the selected firms (companies) on Ghana stock exchange. According to Table 10 above, there is a significant relationship between return on asset (ROA) and financial distress (FDS) of selected firms with t-value of 2.07786 and probability valueof 0.04081. That is the probability-value is less than 5 percent. And it shows that return on asset (ROA) has a direct significant relationship with FDS index. Furthermore, the coefficient of ROA suggests a positive relationship with the FDS.

Third Hypothesis: There is no significant relationship between liquidity and financial distress. Third hypothesis results: The result shows a significant

relationship between liquidity (current ratio) and financial distress level (FDS) of selected firms (companies) on Ghana stock exchange. According to Table 12 above, there is positive significant relationship between CRT and index FDS of selected firms with t-value of 4.00439 and probability of 0.0065, because the p-value is less than 5 percent. Also cash conversion cycle (CCC) which is another measure of liquidity further proved that there is a significant relationship between liquidity and financial distress level of the selected firms.This confirms the statement made by Pandy (2005, p.42) that financial distress, is the inherent possibility that a firm may face a tight business conditions and thus have difficulties in paying owed amounts as and when they fall due.

Fourth Hypothesis: There is no significant relationship between size of a firm and financial distress level.Fourth hypothesis results: The result demonstrated that there is a significant relationship between Size and index FDS of selected firms (companies) on Ghana stock exchange. According to Table 10 above, there is a significant relation between size and index FDS of selected firms with t –value of-2.49835andprobability of0.03955, because it has p-value which is less than 5 percent .The coefficient has a value = -0.03666 and shows that there is weak negative relationship between size and financial distress levels. And it shows that size has an indirect significant relationship with FDS index i.e. if the size (log of total asset) is increased by one percent, the FDS index value will be decreased by 3.95 percent. This is in agreement with Niskanen & Niskanen (2006, p.82) who stated that larger firms have stronger bargaining power with credit suppliers, and would use these advantages to finance their working capital to improve financial health.

Notwithstanding, cost of sales shows a significant relationship with financial distress.

The relationship between the external determinants of working capital and corporate financial distress level

The External Working Capital Determinants include: Gross Domestic Product (GDP), Inflation Rate (INFL), Exchange Rate (EXR), Interest Rate (INTR),and Market value of the firms' equity (MKTVE). Model three below shows the relationship between the external determinants of working capital and financial distress level in the Ghanaian manufacturing companies of the selected firms. Model 3

$$FDS_{it} = C_0 + C_1 GDP_{it} + C_2 INFL_{it} + C_3 EXR_{it} - C_4 INTR_{it}$$
$$+ C_5 MKTVE_{it} + \mu_{it}$$

Whenthe FDS index is regressed against the rest of the external variables we can determine how individual external determinants of working capital influence the financial distress level of the selected manufacturing firms as follows in the Table 13 below:

Table 13: Relationship between external determinants and FDS

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.7825	0.9016	0.8677	0.38797
GDP	-2.8146	2.0256	-1.3891	0.16843
INFL	-0.0914	0.0592	-1.5448	0.12609
INTR	0.1768	0.0734	2.4066	0.01826
EXR	-0.4485	0.1709	-2.6241	0.01029
MKTVE	-6.6787	9.1267	1.8813	0.05337

Effects Specification			
Cross-section fixed (dummy variables)			
R-squared	0.34720	Mean dependent var	1.19258
Adjusted R-squared	0.32650	S.D. dependent var	1.54767
S.E. of regression	1.42981	Akaike info criterion	3.69044
Sum squared resid	173.771	Schwarz criterion	4.08122
Log likelihood	-169.522	Hannan-Quinn criter.	3.84860
F-statistic	2.21387	Durbin-Watson stat	1.52866
Prob(F-statistic)	0.01331		

Source; Author's own estimate, 2015

Hypotheses test Results

The hypothesis is to test if there is no significant relationship between GDP as external working capital determinant and financial distress level of the selected firms. The hypothesis results from Table 13 above, GDP showed no significant relationship with financial distress level of the selected firms under this study at 5% significant level with the t value of 0.8677 and probability of 0.38797.The coefficient value of 0.682154 shows a strong positive relationship between GDP and FDS. This is consistent with Lamberson (1995,p.45) who also had a positive relationship between working capital and GDP in similar study and opined that the level of working capital would increase during economic boom and decrease during economic slump.

The next hypothesis is to test if there is no significant relationship between Inflation rate as an external working capital determinant and financial distress level of the accepted firmsThe hypothesis results confirmed that Inflation Rate has no significant relationship but it is negatively correlated to the financial Distress level of the selected firms. From Table 13, inflation rate, has t-value = -1.5448 and with probability-value of 0.12609. And these values show that there is no significant relationship between inflation rate as an external determinants of working capital management and the financial distress level of the listed selected firms because the probability-value is greater than 5 percent. However, the coefficient of the inflation rate = -0.0914 shows an inverse relationship with the financial distress level of the selected firms which demonstrates that when inflation rate falls below the optimum level, the financial distress level of the manufacturing firms under this study increased or worsens. This is because an optimum amount of inflation is required for an economy to operate in its full capacity. Notwithstanding, a moderate fall in inflation will improve the financial health of the distress firms because usually firms pass on inflation to the final consumers and vice versa.

Another hypothesis is to test if there is no significant relationship between interest rate as an external working capital determinant and financial distress level of the selected firms. The result shows that Interest Rate has a significant relation with the financial Distress level of the selected firms. From Table 13, interest rate has t-value of 2.4066 and probability value of 0.01826. And it shows that interest rate has a significant relationship with the financial distress level of the selected firms at 5% significant level. This confirms the fact that high cost of borrowing in Ghana charged by banks and other credit

institutions as lending rate irrespective of the policy interest rate probably because of level of risk in the manufacturing sector is worsening the financial distress status of the manufacturing firms. Furthermore, the coefficient of the interest rate of 7.354478 shows a strong positive relationship with financial distress which assumes that when the interest rate moderately falls to the required threshold, firms' financial distress level also falls or improves for better. Because, banks pass on the fall in the policy rate in a form of lending rate to the firms all things being equal.

Also the hypothesis that there is no significant relationship between Exchange rate as an external working capital determinant and financial distress level of the accepted firms is tested. Hypothesis results shows that Exchange Rate has some significant relationship with the financial Distress level of the selected firms. From Table 13 above, the exchange rate has t-value of-2.6241and probability of 0.01029. And these values show that exchange rate has significant relationship with financial distress level of the selected firms at 5% significant level. This confirms the notion that the manufacturing firm engage in import and export it will be much affected by exchange rate fluctuations. In Ghana most of the goods manufactured are for the home market with few exported to earn foreign exchange (CSIR, 2013). However, the coefficient of the exchange rate of -1.095579 shows a negative correlation with financial distress level. And it shows that when the Ghana cedi depreciate or falls against USA dollar and other currencies of trading partners, firms whose raw materials are imported before manufacturing can take place get into worse financial distress level thus FDS increases and vice versa.

In addition to that hypothesis that there is no significant relationship between firms' Market Value of Equity as an external working capital determinant and financial distress level of the selected firms was tested. The result shows that Market Value of Equity of the selected firms has a significant relationship with financial distress level of the firms. From the Table 13 above, Market Value of Equity of the selected firms over the study period has t-value of 1.881305 and probability of 0.0534. And it shows that the Market value of Equity of the selected listed manufacturing firms in Ghana has significant influence on the financial distress levels

The model's adjusted R^2 implies that 32.65% of the variation in the working capital determinants and its influence on the financial distress level of the firms can be explained by the model. The coefficients of the other variables included in the model are also highly significant.

Working Capital Component and its relationship with Financial Distress Level

The net working capital components as used in this study include: Current Assets: inventory and receivables. Current liabilities: payables

Model four below shows the relationship between the net working capital and financial distress level in the Ghanaian manufacturing industry of the accepted firms. Model 4

$$FD_{it=}C_1 Dinvt_{it} + C_2 DREC_{it} + C_3 DPYT_{it} + C_4 CAS_{it-}C_5 CAL_{it} + \mu_{it}$$

When the FDS index is regressed against the rest of the working capital component variables we can determine how individual determinants of net working capital influence the financial distress level in the manufacturing industry as follows in the Table 14 below:

Table 14. The working capital components and financial distress level

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.244060	0.373205	6.0129	4.423099
INVT	-2.921404	7.32458	-3.9884	0.000140
RECIEV	-4.715188	1.83253	-2.5730	0.011816
PAYT	-5.128706	2.60097	-1.9718	0.051880
CAS	2.188611	1.30487	2.0611	0.042110
CAL	-4.540007	1.28370	-2.4959	0.014425

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.666183	Mean dependent var	1.192587
Adjusted R-squared	0.561790	S.D. dependent var	1.547677
S.E. of regression	1.329750	Akaike info criterion	3.545341
Sum squared resid	150.3001	Schwarz criterion	3.936116
Log likelihood	-162.2670	Hannan-Quinn criter.	3.703495
F-statistic	3.507732	Durbin-Watson stat	1.868986
Prob(F-statistic)	0.000156		

Hypothesis Test Result

First Hypothesis from Table 14 is to test if there is no significant relationship between current asset as working capital component and financial distress level of the selected firms. The first hypothesis result shows that current asset of the selected firms has a significant relationship with financial distress level of the firms. From the Table 14 above, current asset has t-value of2.064113and probability value of 0.0421. And it shows that indeed there is positively significant relationship between current asset and financial distress level of the selected firm at 5% significant level. Also the coefficient of the current asset of 2.188611 demonstrates that current asset has positive relationship with financial distress level of the selected firms which shows that when current asset increases financial distress level also increases. Thus

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firm's ability to pay its debt suffers when current asset increases as a result of inventory being pile-up or sales amount are not collected leading to receivables being created.

Second Hypothesis test whether there is no significant relationship between inventory as   working capital component and financial distress level of the selected firms.Second hypothesis results proved thatdays of inventory of the selected firms have significant relationship with financial distress level of the firms. From the Table 14, days of inventory has t-value of -3.9884 and probability of 0.000140. And it shows that there is significant relationship between days of inventory and financial distress level of the selected firm at 5% significant level. Furthermore, the coefficient of the days of inventory is of -2.921404. And it shows that days of inventory has negative relationship with financial distress level of the selected firm. That is when days of keeping inventory increases in the working capital cycle; financial distress level worsens or increases.

Third Hypothesis: There is no significant relationship between days of account receivable as working capital component and financial distress level of the selected firms. The result shows that days of account receivable of the selected firms has significant relationship with financial distress level of the selected firms. In the Table 14 above, the probability-value of0.011816and t-value of-2.5730 proved that account receivable has significant relationship with the financial distress level.   However the coefficient of days of account receivable (REC) of-4.715188shows a moderate negative relationship with financial distress level of the selected firms.

Fourth Hypothesis: There is no significant relationship between days of account payable as working capital component and financial distress level of the selected firms. The fourth hypothesis results shows that days of account payable of the selected firms has significant relationship with financial distress level of the selected firms. In the Table 14 above, the probability-value of 0.051880 and t-value of -1.9718 shows that account payable has significant relationship with the financial distress level. But the coefficient of PYT of -5.128706 indicates a strong negative relationship with financial distress. Thus ability of the firm to pay its trade creditors as and when it fall due plays a key role in determining the financial distress level of the selected firms.

Fifth Hypothesis: There is no significant relationship between current liabilities as working capital component and financial distress level of the accepted firms. The results shows that current liability of the selected firms has a significant relationship with financial distress level of the selected firms at 5%. In the Table 14 above, the p-value= 0.0145 and t-value = -2.495949 reject the hypothesis that current liability has no significant relationship with the financial distress level. Also, the coefficient = -4.5407 shows an inverse relationship between financial distress and current liability of the selected firms.

Table 15 below combines internal and external determinants as well as the components of working capital regression test results from model analysis with fixed effect. This help to determine how the determinants will behave if all factors are moving concurrently as it happens in real life situation.

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Table 15: The combined effect of Working Capital Management determinant and financial distress

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.9603	2.4752	1.5999	0.1139
GROWTH	-0.0026	0.0043	-0.6057	0.5465
ROA	0.0252	0.0123	2.0422	0.0447
SIZE	-0.5523	0.3940	-1.4015	0.1652
LEV	1.1900	0.1915	6.2116	2.9019
CRT	-0.0084	0.0099	-0.8448	0.4009
COSALES	-1.0108	3.4663	-2.9161	0.0047
GDP	-5.7086	3.8811	-1.4708	0.1456
INFL	0.0259	0.0519	0.4997	0.6187
INTR	-0.0413	0.0859	-0.4813	0.6317
EXR	0.2644	0.2956	0.8944	0.3740
MKTVE	1.3234	5.8058	2.2795	0.0255
INVT	-7.9318	6.8393	-1.1597	0.2499
RECIEV	-2.0573	1.4428	-0.1425	0.8870
PAYT	1.4749	5.2728	0.2797	0.7804
CAS	2.6248	1.1688	2.2457	0.0277
CAL	-8.8335	4.5885	-1.9251	0.0581
CCC	-0.0003	0.0001	-2.6708	0.0093

	Effects Specification			
Cross-section fixed (dummy variables)				
R-squared	0.7411	Mean dependent var		1.1925
Adjusted R-squared	0.6487	S.D. dependent var		1.5476
S.E. of regression	0.9172	Akaike info criterion		2.8903
Sum squared resid	61.4155	Schwarz criterion		3.5937
Log likelihood	-117.51847	Hannan-Quinn criter.		3.1750
F-statistic	8.03325	Durbin-Watson stat		1.6614
Prob(F-statistic)	9.50342			

The regression Table 15 above shows how both internal and external determinants of working capital jointly relate to financial distress level of listed manufacturing firms in Ghana all things being equal. Surprisingly, some of the variables that were significant became insignificants and vice versa, when all factors are moved together concurrently. This can be further represented graphically as follows:

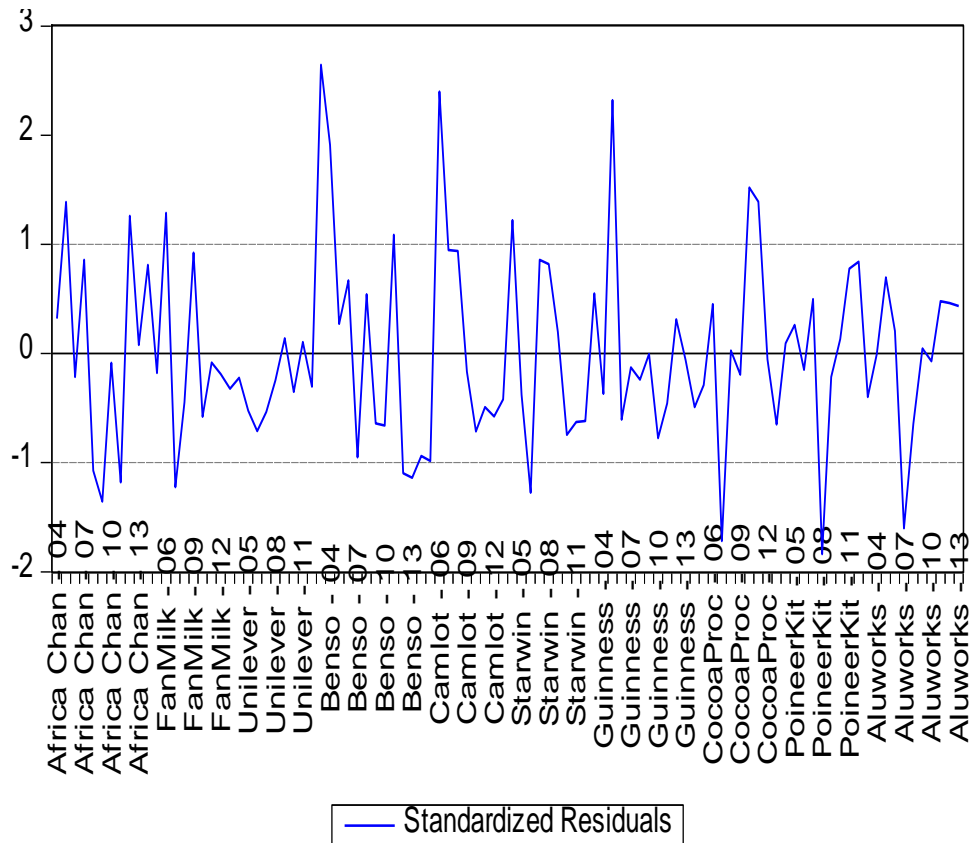Figure 5. Graphical representation of internal and external determinants of WCM.

The above graph shows the pictorial representation of how working capital determinants relate to financial distress when all factors are working together concurrently as it happens in real life situation. It can be noted that financial distress levels have unstable among firms and it is difficult to predict the probability of default.

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CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

An Overview

This chapter presents the summary and conclusion drawn from the analysis of empirical results and connected to the research questions and objectives. Then, it also provides relevant areas for further consideration for future study.

Before discussing the summary of the main findings and contribution of this research work, it is useful to review its foundation and the milestones. This research began with identification of problems in the manufacturing sector of Ghana which can lead to financial distress and eventually corporate failure as well as extensive review of extant literature on Working Capital Management and financial distress to examine the influence of determinants of Working Capital Management on financial distress level in contemporary manufacturing organizational contexts. In the first instance, the review identified seven distinct variables representing the major internal determinants of Working Capital Management which include: sales growth, asset size, profitability, liquidity, cash conversion cycle, leverage, cost of sales and their influence on financial distress level. Secondly, the review was extended to learn about other external factors of Working Capital Management influencing financial distress level such as gross domestic product, inflation, exchange rate, interest rate and market value of equity of the selected firms.

Thirdly, the research also focused on the relationship between the components of working capital such as current asset, current liability, days of inventory, days of account receivable and days of account payable and

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financial distress level of the listed manufacturing firms in Ghana which is embedded within an organizational context. Finally, this study used the modified Altman's financial distress model (Z-score model) to evaluate the extent to which manufacturing firms in Ghana are financially distressed. According to Vander (2006), many Scholars have put much effort into developing sophisticated financial models to manage working capital components. However, in a globalization era, where knowledge is paramount in gaining competitiveness, financial models alone are not sufficient to support managers to avert financial distress in their decision making. Also Chandler (1994, p.54) explained that, different organizations have undergone extensive metamorphosis, where managers' creativity and innovative initiatives are now imperative for organizational adaptability in highly competitive markets.

With that in mind, this study aimed and answered the fundamental research question: What is the relationship between the determinants of working capital and financial distress level of listed manufacturing firms in Ghanaian?

Four secondary questions were generated out of the main research question as follows: (1) How can the working capital determinants be used to measure the financial distress level of listed manufacturing firms in Ghana? (2) How do the internal determinants of Working Capital Management influence financial distress level of the listed manufacturing firms? (3) What are the external determinants of Working Capital Management that influence financial distress levels? (4) What are the relationship between the working capital components and financial distress level?

This research answered the above questions by developing an early understanding of WCM in the Ghanaian context and formulated the relevant financial models.

Evidence was then collected from five intensive case studies, offering an in-depth understanding of WCM determinants and financial distress, particularly in manufacturing listed companies. At this stage, secondary (a wide-range of document) data were collected for analysis. The variables were transcribed into numbers for coding purposes. The coding process, facilitated by the Eview software, consisted of open codes, categories, and themes which led to testing of hypotheses and the regression results

SUMMARY OF FINDINGS

Summary of testing of hypotheses and Regression result

Measurement of financial distress levels of the listed manufacturing firms.

The finding obtained after applying the modified model above to measure financial distress levels of the manufacturing companies in Ghana, revealed From Table 9 that six out of the ten selected firms such as, Guiness Ghana limited, FanMilk Ghana limited, Benso Oil, Aluworks, and Unilever companies have average A-score value of 1.7658,1.7231,1.6741,1.2165,1.7217 and 1.7217 respectively which are greater than the actual critical A-score value of A$\geq$ 1.12. And it shows that such firms were in safe zone and away from financial distress over the ten year period under this study. However, such firms which are far away from financial distress are also exposed to highest risk as can be seen from the standard deviation figures from Table 9 above.

However, two of the Companies such as Cocoa processing Company and Starwin Ltd found themselves in the gray zone with the mean financial distress level of 0.7522 and 0.8131respectively. And it shows that these two companies should be on alert and exercise caution on fiscal health. Meanwhile, companies like African Champion limited and Pioneer Kitchen Company, showed the sign of bankruptcy with the A-score value of .2849 and 0.1773 respectivelywhich are less than the range of 0.5 of the Actual critical A-score model value. This means African Champion and Pioneer Kitchen are in "Distress Zone"; the companies are in financial distress, probability of bankruptcy is very high and should be prepared to implement some of the recommendations of this research in the chapter five.

The overall mean score value of 1.1925 shows that the manufacturing sector of Ghana is more closer to Gray zone when compared with the critical A-score value of A: $1.12 \leq A \leq 2$- during the 2004 to 2013 periods of the study and shows that the companies in the manufacturing sector should be on alert and exercise caution on fiscal health.

The relationship between internal determinants of working capital and financial distress:

Using the model two to find the relationship between internal determinants of working capital and financial distress levels, the outcome confirmed that growth is significantly related to financial distress at 5% (0.05) level with growth probaility-value (p) = 0.00026,* p<0.05. Also, cash conversion cycle (CCC) is found to be significantly related to financial distress. With CCC, probability-value (p) = 0.00862* Confirmed that CCC is significant because p<0.05. Return on Asset (ROA) is also significantly related to financial

distress. Probability-value (p) =0.04081* Confirmed that ROA is significant at 5% because p<0.05.   Company size is significantly related to financial distress. Probability-value = 0.03955 * Confirmed that size is significant because p<0.05. It was also confirmed that Cost of sales is significantly related to financial distress. Cossale, probability -value =0.03159* Confirmed, because   probability-value <0.05.

In addition, Current ratio (CRT) is found to be significantly related to financial distress. CRT, had a probability-value = 0.00650* Confirmed that current ratio is significant because p<0.05. However, Leverage ratio is not significantly related to financial distress as the probability-value=2.16772 rejected, the hypothesis that leverage is significant because p>0.05. The adjusted R^2 = 0.7411, shows that 74.11% of dependent variable is explained by the independent variable.

The relationship between external determinants of working capital and financial distress

After using the model three above to establish relationship between the external determinants of working capital and financial distress levels the finding revealed in the first hypothesis (H1) that GDP is not significantly related to financial distress at 5% (0.05) with GDP probability-value (p) =0.16843** and rejected the hypothesis because p>0.05. In H2, Inflation (LINFL) rate is not significantly related to financial distress. LINFL had probability-value= 0.12609 **Rejected the hypothesis because p>0.05.

However, in H3: Interest rate (LINTR) is found to be significantly related to financial distress with LINTR, probability-value = 0.01826* Confirmed the hypothesis because p<0.05. Also in H4: Exchange rate (LEXR) is found to be

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significantly related to financial distress. LEXR, probability-value = 0.01029*

Confirmed the hypothesis because p<0.05. In addition, in H5, Market value of

equity (MKTVALUE_OF _EQUITY) is confirmed to be significantly related

to financial distress with MKTVALUE_OF_EQUITY, probability -value=

0.05337 Confirmed the hypothesis because p≤0.05

The relationship between components of the working capital and

financial distress

Using the model four above the findings revealed from Table 14 that all

the components of   working capital management are significantly related to

financial distress. Moreover, the current liability, current asset and days of

inventory are most significant at 5% level. This is in agreement with the

definition of Pandy (2005) that financial distress, is the inherent possibility

that a firm may face a tight business conditions and thus have difficulties in

paying owed amounts as and when they fall due.

CONCLUSIONS

The results shows that for overall manufacturing sectors in Ghana,

Working Capital Management has a significant impact on financial distress

level of the firms and plays a key role in value creation for shareholders and

survival of the firms. For instance, the overall mean of A-score value of

1.1925 in Table 9 above, shows that the manufacturing sector of Ghana is in

safe zone when compared with the critical A-score value of A: 1.12 ≤ A ≤ 1.5-

during the 2004 to 2013 periods of the study. And it shows that though the

companies are in safe zone but closer to the gray zone and should be on alert

and exercise caution on fiscal health;. This uncertainty that firms in the

manufacturing sector find themselves in, may be attributed to erratic power

supply, rising cost of production and stiff competition with imported goods that have bedeviled the Ghanaian economy during the period of this research.

To confirm the predictive ability of the financial model, I also travelled to visit the two firms that proved to be financially distressed. It was revealed that the original name of African Champion Company which is most distressed as per this research is Super Paper Company located in Tema in the Greater Accra region of Ghana. But Super Paper Company became financially distressed and was liquidated and reconstituted as African Champion in 2011 but all old documents still bear the new name African Champion on the Ghana Stock Exchange. Moreover, Pioneer Kitchen Company which is the next most distressed firm according to this research is near liquidation and management have listed it on Stock Exchange in order to raise additional capital in order to survive.

First, in addressing the first research objective, this study reveals seven internal working capital determinants in the organizational context believed to influence financial distress such as debt ratio, return on asset, size of asset, gross operating profit, current ratio, current liability and current asset. The researcher was not able to find in the Ghanaian context where any periodical articles on working capital, were linked to financial distress level of the listed firms had been fully discussed. The study, with its seven determining perspectives, therefore contributes to the enrichment of working capital literature. Furthermore, the study extends the views of previous studies in WCM, such as Lamberson (1995), Gitman et al. (1979), Duran (2001), Brigham and Ehrhardt (2008) which suggested that effective WCM exceeded just the financial models and incorporated other disciplines.

Second, and at a more fundamental level, the framework provides insights foracademicians and management practitioners to explain how external influence on Working Capital Management affect financial distress level in a contemporary organizational context, referring the second research objective. Fundamentally, the framework can be used as a diagnostic tool for managers in formulating WCM strategy in order to be in a stronger position to see beyond the internal forces of the individual organizational needs . Subsequently, this enables academicians to elucidate the degree of integration of possibility of financial distress in the working capital management decision making processes. Mindful of the research issues raised by McInness (2000), the current study provides an explanation of why there is diversity in WCM and which circumstances of determining perspectives influenced managerial style in working capital management.

Third, the intuitions from this research may be used to support academicians in creating decision making models to assist managers in different organizational needs. In a sense, this may enable academicians to develop more versatile financial models to support managers in making decisions to change and explain the dynamism in the components of Working Capital Management and corporate financial distress. In fact, based on findings of this research there still require further investigation into some key issues on relationship between working capital and financial distress (refer to the future research section for details).

Fourth, the study extends the role and scope of finance managers to include evaluation of financial distress level of their firms annually. The traditional view is that designated finance managers are to be responsible for

all financial aspects (Trahan &Gitman, 1995), and to have sole responsibility for working capital performance (Gitman, Maxwell, &Singhvi, 1990). This notion has significantly changed in the contemporary organizational context, in which finance managers may be required to understand areas outside of the accounting discipline, and interactions between managers from diverse fields across an organization are crucial, especially in decision making processes (Van der Stede, et al., 2006). This broadens the scope of working capital and requires support and interdependency across business units/departments to improve organizational performance.

Taking together all aspects discussed in this section, it is apparent that WCM is not static, but rather it is embedded within organizational dynamics and consequently reflects the rich patterns of internal and external determining perspectives which represent a focal point of the study. Therefore, it is imperative to evaluate the circumstances of these determining perspectives, which, in turn, enables academicians or managers to determine an appropriate WCM approach for each company.

In all, working capital determinants have influence on financial distress and if manufacturing firms in Ghana can manage their working capital efficiently, they can escape financial distress which is one of the key symptoms of corporate failure.

RECOMMENDATIONS

Recommendation for Managerial Policy making

The research provides some insight into Working Capital Management (WCM) by identifying two approaches: External and Internal Analysis of the determinants of working capital. The main implication for managerial policy

formulation is that working capital management should go beyond the traditional practice of managing only cash, inventories, receivables and payables but must also include regular evaluation of the financial distress status of the firms to test how closer the firms are distressed financially.

Also, based on the above findings financial distress can be avoided if firms take the following precautions:

i.   Do not invest excessively in fixed asset: Platt and Platt (1991a) found that companies that invested heavily in fixed assets have higher financial distress risk. The finding of this research supports the earlier discovery by saying that companies must not over invest in either fixed assets or current assets; there should be an appropriate investment level for each.

ii. Do not over borrow more than sum of its asset

iii. Do not grant credit for longer period than number of days of account payable

iv. Intensify advertising campaign that lead to the sale of its finished goods

v.   Reduce cost of sales as much as possible

vi. Retain and plough back profit in the firm to ensure growth.

vii. Be conscious of microeconomic indicators and their potential effect on the finances of the firm.

Also, where the perceived environmental turbulence is high, managers of manufacturing companies operating in   such volatile markets are expected to critically examine both internal and external measures and its potential effect on the firms' working capital when making decisions (Van der Stede, et al., 2006, p.23). In such a situation, integrating the possibility of financial distress in the WCM approach would be more appropriate.

However, if the manufacturing companies are operating in a relatively stable environment where perceived environmental uncertainty is low, managers might undertake specified financial targets without necessarily the need to predict the level of financial distress. Management of financially distress firms can therefore adopt some the following strategies:

- Selling major assets.

- Merging with another firm.

- Reducing capital spending on research and development.

- Issuing new securities.

- Negotiating with banks and other creditors.

- Exchanging debt for equity.

- Filing for bankruptcy. Ross et.al (2010,p.955)

Recommendation for Future Research

The incompleteness of the Working Capital Management conceptual framework has created a number of opportunities for future research. Continued research linking the framework to organizational forms and including more detailed financial distress analysis would be a key area requiring immediate attention. This could provide necessary information about financial distress level in different Working Capital Management approaches which will help academicians and financial managers to formulate financial models that are more dynamic and applicable in complex organizational settings. This could also extend the rigor of the framework in explaining WCM determinants from a financial analyst's perspective. Furthermore, continued research examining potential prospects in information

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technology and organizational culture regarding WCM determinants and financial distress would be valuable.

Specifically, future research interested in contributing to the growing body of Working Capital Management knowledge in manufacturing industry contexts should focus on:

1. The relationship between the lending rate and policy interest rate and their effect on financial distress level in the manufacturing industry in Ghana

2. Inflation threshold and its effect on financial distress level in the manufacturing industry in Ghana

3. Working capital management practice and its effect on financial distress level of the listed manufacturing firms in Ghana

4. Determinants of financial distress in the manufacturing industry in Ghana.

The above suggestions emphasize the fact that continuing research is required and our understanding and knowledge about Working Capital Management and financial distress in organizational context must also evolve. That is the scope of WCM is broad and the main findings of this study are not a tentative paradigm but simply confirm to the evolving nature of how internal and external forces influence manufacturing organisations.

Based on the findings of the study, financial managers in wealth maximizing manufacturing firms should not place an absolute reliance on financial models alone in determining their financial distress status. "Organization must also constantly modify and refine the mechanism by which they achieve their purposes – rearranging their structure, roles, and

relationships and their decision making and control processes involving working capital management in order to avoid financial distress". Miles and Snow (2003, p. 3). This is because the financial models were found to effectively explain only 25% of occurrence in financial distress. Instead, they should focus on maximizing earnings and retaining as much earnings as possible for further reinvestments in order to land themselves in a safe credit position, Ross et al (2010).

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APPENDICES

APPENDIX A: Companies listed on the Ghana Stock Exchange as at

1ˢᵗ Jan. 2015

Listed Companies	Available Statements by Year
African Champion Industries	2004, 2005, 2006, 2007, 2009, 2010, 2011, 2012, 2013
Aluworks	2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013
AngloGold Ashanti	2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013
Ayrton Drug Manufacturing	2007, 2008, 2009, 2010, 2011, 2012, 2013
Benso Oil Palm Plantation	2004, 2005, 2006, 2007, 2009, 2010, 2011, 2012, 2013
CAL Bank	2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013
Camelot Ghana	2004, 2005, 2006, 2008, 2009, 2010, 2011, 2012
Clydestone Ghana	2004, 2005, 2007, 2008, 2009, 2010, 2011
Cocoa Processing Company	2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012
Ecobank Ghana	2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013
Ecobank Transnational Incorporated	2004, 2005, 2006, 2008, 2009, 2010, 2011, 2012, 2013
Enterprise Group	2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013
Fan Milk	2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013
GCB	2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013
Ghana Oil Company	2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013
Golden Star Resources	2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013
Golden Web	2006, 2007, 2008, 2009 + 2010
Guinness Ghana Breweries	2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013
HFC Bank (Ghana)	2004, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013
Mechanical Lloyd Company	2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013
Mega African Capital	2013
Pioneer Kitchenware	2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011
PBC	2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013
PZ Cussons Ghana	2004, 2005, 2006, 2008, 2009, 2010, 2011, 2012, 2013, 2014
Sam-Woode	2004, 2005, 2006, 2008, 2009, 2010
SocieteGenerale Ghana	2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013
SIC Insurance Company	2007, 2008, 2009, 2010, 2011, 2012, 2013
Standard Chartered Bank Ghana	2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013
Starwin Products	2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013
Total Petroleum Ghana	2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013
Transaction Solutions Ghana	2008, 2010, 2011

Trust Bank (The Gambia)	2003, 2004, 2005, 2009, 2010, 2011, 2012, 2013
Tullow Oil	2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013
Unilever Ghana	2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013
UT Bank	2007, 2008, 2009, 2010, 2011, 2012, 2013

APPENDIX B: average **Inflation rate (consumer prices index)**

CIA World Factbookhttp://www.indexmundi.com/ghana/inflation_rate_%28consumer_prices%29.html

Country	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013

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Ghana	12.8	22.8	25	14.5	26.7	13	15.1	10.9	10.7	16.5	19.3	10.9	8.7	8.85	11.10

Definition of Inflation rate (consumer prices): This entry furnishes the annual percent change in consumer prices compared with the previous year's consumer prices.

Definition of GDP - per capita (PPP): This entry shows GDP on a purchasing power parity basis divided by population as of 1 July for the same year. Source: CIA World Factbook - Unless otherwise noted, information in this page is accurate as of January 1, 2014

Source: https://www.cia.gov/library/publications/the-world-factbook/

Year	Gross domestic product based on purchasing-power-parity (PPP) per capita GDP	Percent Change
2000	1442.966	3.79 %
2001	1503.502	4.20 %
2002	1559.093	3.70 %
2003	1631.547	4.65 %
2004	1928.179	18.18 %
2005	2030.024	5.28 %
2006	2168.443	6.82 %
2007	2316.291	6.82 %
2008	2503.286	8.07 %
2009	3659.800	46 .45%
2010	4604.220	25.80 %
2011	5981.600	29.91%
2012	7310.900	22.22%
2013	8477.600	15.95%

http://www.indexmundi.com/ghana/inflation_rate_%28consumer_prices%29.html

APPENDIX C :   Comprehensive Income Statement Extract From Two Firms Which Experience Negative EBITDA For More Than Two Consecutive Years:AFRICAN CHAMPION INDUSTRIES

African Champion Industries Limited
Consolidated income statement
For the year ended 31 December 2011

		Group	Company	
		2011	2010	**2011**
		GH¢	GH¢	**GH¢**
Note				
Sale of goods		**3,752,563**	4,465,663	**4,010,267**
Revenue		**3,752,563**	4,465,663	**4,010,267**
Cost of sales	5	**(3,791,299)**	(3,058,535)	**(3,823,144)**
Gross profit/(loss)		**(38,736)**	1,407,128	**187,123**
Other income	6.1	**371,929**	21,989	**371,465**
Selling and distribution costs	6.2	**(49,639)**	(71,331)	**(50,080)**
Administrative expenses	6.3	**(1,464,794)**	(1,266,979)	**(1,659,114)**
Profit/(loss) on disposal		**494,916**	(5,300)	**502,284**
Operating (loss)/profit		**(686,324)**	85,507	**(648,322)**
Finance costs	6.4	**(396,252)**	(367,186)	**(412,006)**
(Loss)/profit before tax		**(1,082,576)**	(281,679)	**(1,060,328)**
Income tax expense	7	**(134,368)**	(1,510)	**(147,722)**
(Loss)/profit for the year		**(1,216,944)**	(283,189)	**(1,208,050)**
Earnings per share	8	**-**	-	-

CONSOLIDATED STATEMENT OF INCOME
For the year ended 31 December 2013

Continuing Operation	Notes	Company		Group	
		2013	2012	**2013**	2012
		GH¢	GH¢	**GH¢**	GH¢
Revenue		**455,186**	-	**2,243,769**	913,024
Operating cost	5		-	**(1,102,612)**	(548,496)
Gross profit/(loss)		**455,186**	-	**1,141,157**	364,528
Other income	6.1		-	**1,403**	1,191
Selling and distribution costs	6.2		-	**(14,217)**	(3,420)
Administrative expenses	6.3	**(158,082)**	-	**(529,824)**	(221,797)
Profit/(loss) on disposal	10		-	**7,995**	8,541
Operating (loss)/profit		**297,104**	-	**606,514**	149,043
Finance costs	6.4	**(768,920)**	-	**(779,718)**	(15,465)
(Loss)/profit before tax		**(471,816)**	-	**(173,204)**	133,578
Income tax expense	7a		-	**(89,537)**	(94,625)
Profit for the year from continuing operations		**(471,816)**	-	**(262,741)**	38,953
Discontinued operations 9a					
Profit/(loss) for the year from discontinued operations		**(5,627,137)**	(2,983,001)	**(5,627,137)**	2,983,001
Profit/(loss) for the year		**(6,098,953)**	2,983,001)	**(5,889,878)**	(2,944,04)
Profit/(loss) attributable to:					
Owners of the parent		**(6,098,953)**	2,983,001)	**(5,992,325)**	2,963,135)
Minority Interest				**102,447**	19,087
		(2,983,001)	(5,889,878)		**2,944,048)**
Earnings per share	8	**(0.1666)**	(0.0815)	**(0.1637)**	(0.0810)

APPENDIX D: BOG POLICY INTEREST RATE

Meeting No.	MPC Dates		Effective Date	BOG Policy Rate

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1	November 20 - 21, 2002	November 21, 2002	25.50
2	January 22 - 24, 2003	January 24, 2003	25.50
3	March 19 - 21, 2003	March 21, 2003	27.50
4	May 21 - 23, 2003	May 23, 2003	27.50
5	July 16 - 18, 2003	July 18, 2003	26.00
6	October 8 - 10, 2003	October 10, 2003	24.00
7	December 10 - 12, 2003	December 12, 2003	21.50
8	February 18 - 20, 2004	February 20, 2004	20.00
9	May 18 - 20, 2004	May 21, 2004	18.50
10	August 17 - 20, 2004	August 20, 2004	18.50
11	November 9 - 12, 2004	November 12, 2004	18.50
12	January 17 - 21, 2005	January 24, 2005	18.50
13	March 22 - 24, 2005	March 29, 2005	18.50
14	May 24 - 27, 2005	May 30, 2005	16.50
15	July 20 - 22, 2005	July 25, 2005	16.50
16	September 7 - 9, 2005	September 12, 2005	15.50
17	November 22 - 25, 2005	November 28, 2005	15.50
18	January 25 - 30, 2006	January 30, 2006	14.50
19	March 21 - 24, 2006	March 27, 2006	14.50
20	May 16 - 19, 2006	May 22, 2006	14.50
21	July 25 - 28, 2006	July 31, 2006	14.50
22	October 10 - 13, 2006	October 16, 2006	14.50
23	December 13 -15, 2006	December 18, 2006	12.50
24	March 12 - 16, 2007	March 19, 2007	12.50
25	May 14 - 18, 2007	May 21, 2007	12.50
26	August 21 -24, 2007	August 27, 2007	12.50
27	October 15 - 19, 2007	October 22, 2007	13.50
28	January 21 - 25, 2008	January 28, 2008	13.50
29	March 10 - 14, 2008	March 17, 2008	14.25
30	May 19 - 23, 2008	May 23, 2008	16.00
31	July 14 - 18, 2008	July 21, 2008	17.00
32	October 21 - 24, 2008	October 28, 2008	17.00

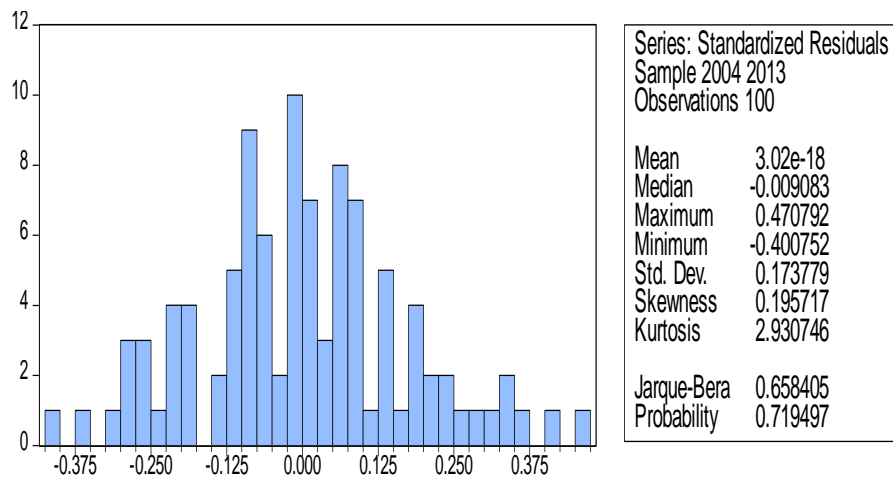| 33 | February 17 - 23, 2009 | February 24, 2009 | 18.50 |
34	May 6 - 8, 2009	May 12, 2009	18.50
35	July 14 - 17, 2009	July 21, 2009	18.50
36	September 16 - 22, 2009	September 23, 2009	18.50
37	November 16 - 18, 2009	November 20, 2009	18.00
38	February 15 - 17, 2010	February 19, 2010	16.00
39	April 12 - 14, 2010	April 16, 2010	15.00
40	July 12 -16, 2010	July 16, 2010	13.50
41	September 13 -17, 2010	September 17, 2010	13.50
42	December 6 - 10, 2010	December 10, 2010	13.50
43	February 14 - 18, 2011	February 18, 2011	13.50
44	May 9 - 13, 2011	May 13, 2011	13.00
45	July 4 - 6, 2011	July 6, 2011	12.50
46	August 29 -September 1, 2011	September 1, 2011	12.50
47	October 17 - 19, 2011	October 19, 2011	12.50
48	December 19 - 21, 2011	December 21, 2011	12.50
49	February 13 - 15, 2012	February 15, 2012	13.50
50	April 11 - 13, 2012	April 13, 2012	14.50
51	June 11 - 13, 2012	June 13, 2012	15.00
52	September 10 - 12, 2012	September 12, 2012	15.00
53	November 12 - 14, 2012	November 14, 2012	15.00
54	February 11 - 13, 2013	February 13, 2013	15.00
55	May 20 - 22, 2013	May 22, 2013	16.00
56	July 29 - 31, 2013	July 31, 2013	16.00
57	September 16 - 18, 2013	September 18, 2013	16.00
58	November 25 - 27, 2013	November 27, 2013	16.00
59	February 5 - 6, 2014	February 6, 2014	18.00
60	March 31 - April 2, 2014	April 2, 2014	18.00

Source: M.M. Hug (2013), The Economy of Ghana,

APPENDIX E: VECTOR ERROR CORRECTION ESTIMATES

CointegratingEq:	CointEq1

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FDS(-1)	1.000000	
RESID(-1)	-14.68285	
	(2.48501)	
	[-5.90857]	
C	-1.451163	

Error Correction:	D(FDS)	D(RESID)
CointEq1	0.068755	0.071359
	(0.01379)	(0.01310)
	[4.98414]	[5.44899]
D(FDS(-1))	-0.515717	-0.083616
	(0.39419)	(0.37421)
	[-1.30830]	[-0.22344]
D(FDS(-2))	0.028183	0.363230
	(0.33065)	(0.31389)
	[0.08524]	[1.15718]
D(RESID(-1))	0.651179	0.227064
	(0.41483)	(0.39381)
	[1.56975]	[0.57658]
D(RESID(-2))	0.130035	-0.215415
	(0.35194)	(0.33411)
	[0.36948]	[-0.64474]
C	0.088585	-0.021229
	(0.14616)	(0.13876)
	[0.60607]	[-0.15300]

R-squared	0.408764	0.450951
Adj. R-squared	0.362573	0.408057
Sum sq. resids	93.92944	84.65179
S.E. equation	1.211465	1.150080
F-statistic	8.849544	10.51305
Log likelihood	-109.6174	-105.9775
Akaike AIC	3.303354	3.199357
Schwarz SC	3.496082	3.392085
Mean dependent	0.063725	-0.042234
S.D. dependent	1.517385	1.494817

Determinant resid covariance (dof adj.)	0.147855
Determinant resid covariance	0.123595
Log likelihood	-125.4752
Akaike information criterion	3.985005
Schwarz criterion	4.434704

APPENDIX F: HISTOGRAM NORMALITY AND UNIT ROOT TEST

Series: Standardized Residuals	
Sample 2004 2013	
Observations 100	
Mean	3.02e-18
Median	-0.009083
Maximum	0.470792
Minimum	-0.400752
Std. Dev.	0.173779
Skewness	0.195717
Kurtosis	2.930746
Jarque-Bera	0.658405
Probability	0.719497

Panel unit root test: Summary

Series: RESID01

Date: 04/27/15   Time: 03:16

Sample: 2004 2013

Exogenous variables: Individual effects

User-specified lags: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-4.89361	0.0000	10	80
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-1.36598	0.0860	10	80
ADF - Fisher Chi-square	32.0071	0.0432	10	80
PP - Fisher Chi-square	71.3566	0.0000	10	90

** Probabilities for Fisher tests are computed using an asymptotic Chi
-square distribution. All other tests assume asymptotic normality.

Appendix G

Table 5. Determinants of coefficients of the modified financial distress model

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Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.488869	2.268964	-0.656189	0.5134
EBIT_TSST	1.796688	0.713371	2.518587	0.0136
NWCP_TSST	0.299222	0.414532	0.721831	0.4723
SALES_TSST	0.007033	0.023986	0.293214	0.7701
MKTV_BKV	0.273057	0.128705	2.121575	0.0367
ACCRT_TSST	1.395027	0.467604	2.983350	0.0037
CA-CL	-0.032196	0.012431	-2.589837	0.0113
LGDP	0.058729	0.346742	0.169373	0.8659
LINFL	-0.598624	0.973445	-0.614954	0.5402
LINTR	1.811662	1.722374	1.051840	0.2958
LEXR	-0.830312	0.596742	-1.391408	0.1676
MKVE	0.086774	0.103809	0.835903	0.4055
DTAX	0.017766	0.085342	0.208172	0.8356
R-squared	0.426397	Mean dependent var		1.120000
Adjusted R-squared	0.347279	S.D. dependent var		0.769100
S.E. of regression	0.621365	Sum squared resid		33.59021
Durbin-Watson stat	1.374231	LIML min. eigenvalue		1.000000

Source: Author's own estimate, 2013

Appendix H

Application of the Modified Model

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The modified model is as follows as follows:

$$FDS = \left[1.79\frac{EBIT}{Total\ Asset} + 0.29\frac{Net\ working\ capital}{Total\ Asset} + 0.01\frac{Sales}{Total\ Asset} + \right.$$

$$0.27\frac{Market\ Value\ of\ equity}{Book\ value\ of\ debt} + 1.39\frac{Accomulated\ Retained\ earnings}{Total\ Asset} - $$

$$\left.0.03\frac{Current\ Asset}{Current\ Liability}\right] \bigg/ \left[LOG\left[\frac{(-0.05*GDP-0.83*EXR-0.59*INFL+1.81*INTR+0.08*MKVE)}{5}\right]\right]$$

The first step is to determine the value of each of the financial ratio and economic variables and apply them in the revised model if financial statement of the firms are given and some economic variables are known as illustrated in the hypothetical example below:

$$\frac{EBIT}{Total\ Asset} = \frac{29774}{101247} = 0.29407$$

$$\frac{Net\ Working\ Capital}{Total\ Asset} = \frac{38943 - 19812}{101247} = 0.18895$$

$$\frac{Sales}{Total\ Asset} = \frac{138969}{101247} = 1.37257$$

$$\frac{Market\ value\ of\ equity}{Book\ value\ of\ debt} = \frac{10,000}{24816} = 0.40296$$

$$\frac{Accumulated\ retain\ earnings}{Total\ Asset} = \frac{66,431}{101247} = 0.656128$$

$$\frac{Current\ Asset}{Current\ Liability} = \frac{38943}{19812} = 1.96562$$

$$Log\ of\ GDP\ in\ purchase\ value\ for\ 2013 = 4.928273$$

$$Log\ of\ BOG\ policy\ interest\ rate\ for\ 2013 = 1.20412$$

$$Log\ of\ average\ inflation\ rate\ for\ 2013 = 1.045323$$

$$Log\ of\ average\ exchange\ rate\ for\ 2013 = 0.450249$$

$$Log\ of\ tax\ paid\ in\ 2013 = 3.928908$$

$$Log\ of\ market\ value\ of\ equity\ for\ 2013 = 4.176207$$

The next step is to calculate the revised A-score:

$A - score = fds$

$$= (1.79 * 0.29407) + (0.29 * 0.18895) + (0.01 * 1.37257)$$

$$+ (0.27 * 0.40296) + (1.39 * 0.656128) + (-0.03$$

$$* 1.96562)/[((-0.22 * 4964282) + (-0.3 * 0.450249)$$

$$+ (-1.79 * 1.045323) + (2.97 * 1.20412) + (2.40 * 4.1762))/5]$$

$$= 1.76303$$

Finally, we determine that the A-score value = 1.76303 is between 1.12 and 2.0 we conclude that investment in the above Company is a good credit risk in the year 2013. In this study the average financial distress level of the firms over the period of ten years were determined using the above modified model with the aid of Excel and Eview software.

Appendix IOhson and Altman Original Models

Both Ohson and Altman models were examined and modified to suit the

Edward Altman,(1968) developed a model using financial statement ratios and multiple discriminates analyses to predict and measure bankruptcy levels for publicly traded manufacturing firms. The resultant model is expressed as follows:

$$Z = 3.3\frac{EBIT}{Total\ Asset} + 1.2\frac{Net\ working\ capital}{Total\ Asset} + 1.0\frac{Sales}{Total\ Asset} +$$

$$.6\frac{Market\ Value\ of\ equity}{...Book\ value\ of\ debt} + 1.4\frac{Accomulated\ Retained\ earnings}{Total\ Asset}$$

where Z is an index of bankruptcy.

A score of Z less than 2.675 indicates that a firm has a 95 percent chance of becoming bankrupt within one year.

However, Altman's results show that in practice scores between 1.81 and 2.99 should be thought of as a gray area.

 In actual use, bankruptcy would be predicted if $Z \leq 1.81$ and non-bankruptcy if $Z \geq 2.99$.

Altman demonstrations that bankrupt firms and non-bankrupt firms have very different financial profiles within one year before bankruptcy.

These different financial ratios are the key intuition behind the Z-score model.

Ohlson (1980) critically assessed the restricting assumptions of multiple discriminant analysis deduced by Altman in 1968 and concluded that the output of the Altman's technique has no single dichotomous score which, in fact, says nothing about the probability of default. In order to mitigate these problems, Ohlson introduces an alternative econometric technique based on the logistic transformations (Logit model).

The overall O-Score function of Ohlsonis defined as:

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$$O - sco = .32 - 0.407\log\left(\frac{Total\ Asset}{GNP\ price - index}\right) + 6.03\left(\frac{total\ liabilitis}{total\ asset}\right)$$

$$- 1.43\left(\frac{working\ capital}{total\ asset}\right) + 0.076\left(\frac{current\ liabilty}{current\ Asset}\right)$$

$$- 1.72(1\ if\ total\ liabilbilties > total\ asset\ else\ 0)$$

$$- 0.237\left(\frac{net\ income}{total\ assets}\right) - 1.83\left(\frac{funds\ from\ operation}{total\ liabilities}\right)$$

$$+ 0.285(1\ if\ a\ loss\ for\ the\ last\ two\ years, 0\ otherwise\ )$$

$$- 0.521\left(\frac{net\ income_t - net\ income_{t-1}}{net\ income_t + net\ income_{t-1}}\right)$$