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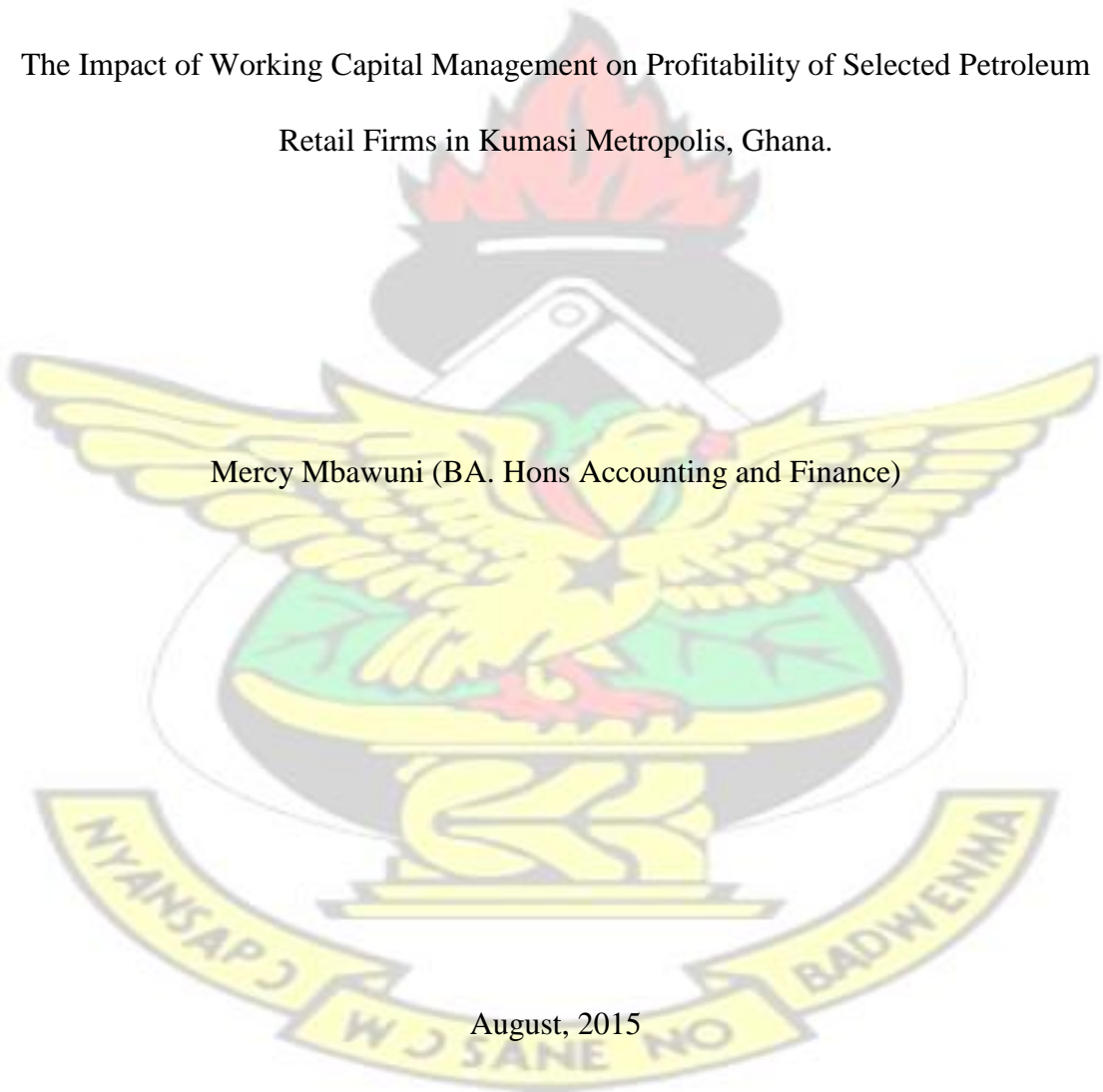
**SCHOOL OF BUSINESS, KNUST**

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The Impact of Working Capital Management on Profitability of Selected Petroleum  
Retail Firms in Kumasi Metropolis, Ghana.

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August, 2015



**THE IMPACT OF WORKING CAPITAL MANAGEMENT ON  
PROFITABILITY OF PETROLEUM RETAIL FIRMS IN KUMASI  
METROPOLIS, GHANA**

**By**

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A Thesis submitted to the Department of Accounting and Finance, Kwame Nkrumah  
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the  
degree of

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School of Business, KNUST

August, 2015

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## DECLARATION

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

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## ABSTRACT

Working Capital is an essential component of every business entity and as such has been described as the lifeblood of a business. Businesses therefore seek to maintain a balance between liquidity and profitability while conducting their day to day operations. The study therefore examined the impact of working capital management (WCM) on the profitability of petroleum retail firms (PRFs) in the Kumasi Metropolis over a six year period (2008-2013). Audited annual reports from a sample of five selected petroleum retail firms in the Kumasi Metropolis are employed in the study. Descriptive analysis as well as correlation and regression analysis are used in the analysis of the data. The results indicate that, in the selected PRFs in Kumasi Metropolis, there is favourable net working capital for the firms and a favourable networking capital to total assets ratio. The most important WCM component that drives the firm's profitability, measured in return on assets (ROA), is average days payable (ADP). The rest of WCM components, cash conversion cycle (CCC), average days inventory (ADI) and average days receivables (ADR) did not have significant relationship with profitability. It is further observed that WCM practices among the five selected PRFs support the conservative strategy of WCM, rather than an aggressive WCM strategy. It is recommended that critical attention be paid to the management of average days of payables (ADP) together with quick ratio (QR) and firm Leverage (LEV) to boost profitability. It also recommends that Industry regulators should improve upon measures to facilitate speedy contractual agreements between the PRFs and the OMCs, to avoid unproductive delays in business transactions resulting from cumbersome documentations processes and demand for collateral security from the PRFs.

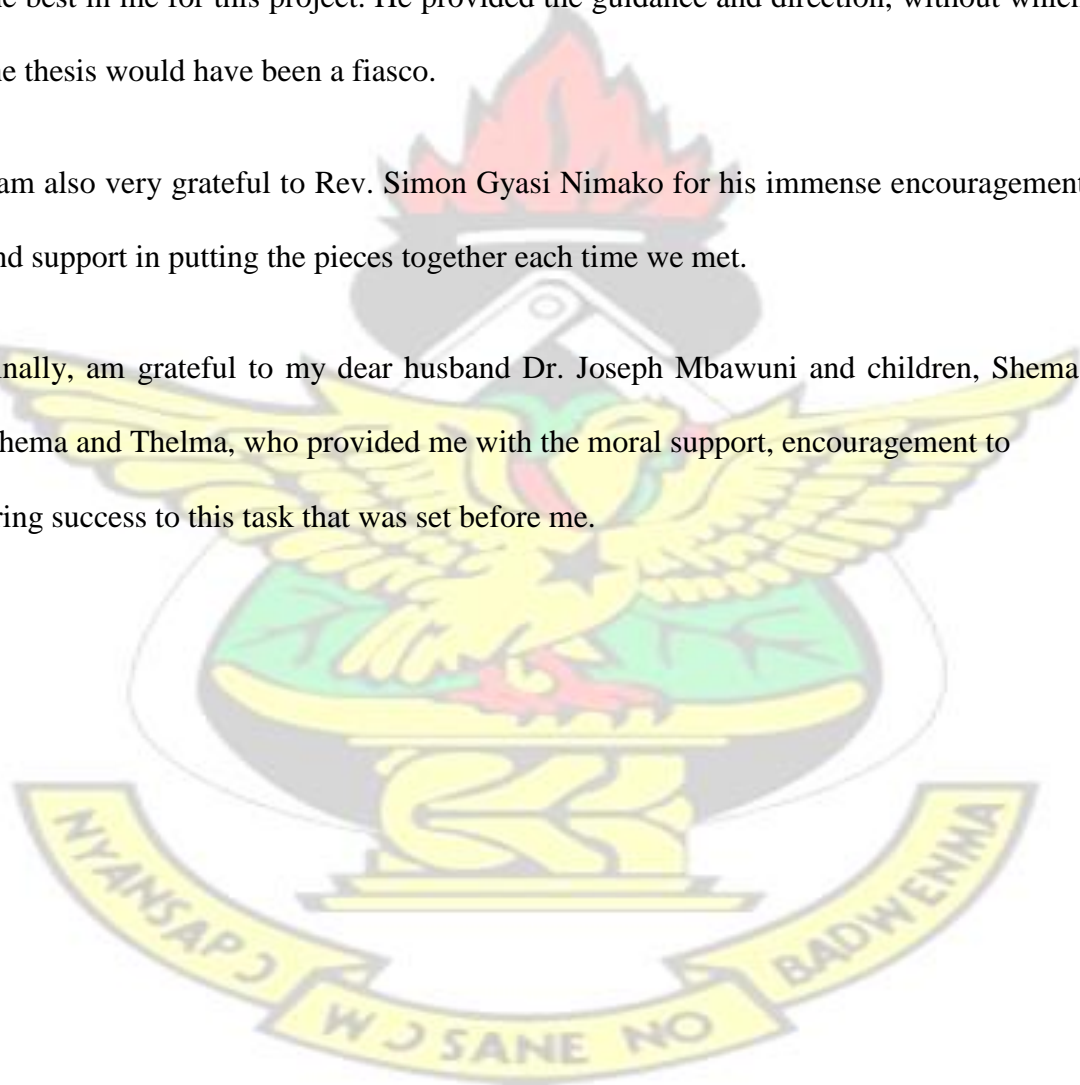


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## DEDICATION

I dedicate this thesis to my dear husband Dr. Joseph Mbawuni and children, Shema, Rhema and Thelma.

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## LIST OF ABBREVIATIONS

Petroleum Retail Firms	PRFs
Working Capital	WC

Working Capital Management                      WCM

Net Working Capital                                NWC

Return on Assets                                   ROA

The Cash Conversion Cycle                      CCC

Inventory Days Inventory                        ADI

Average Days Receivables                      ADR

Accounts Days payable                          ADP

Quick ratio                                         QR

Inventory to Current assets                      ADI/CA

Current Asset to Total Tsset                    CA/TA

Current Assets Turnover                        CA\_TURN

Leverage    LEV

Logarithm of Total Assets                      TALOG

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## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1 Background to the Study**

One of the key determinants of survival and sustainable business growth of modern organisations is the effective accounting and finance department or function (Eljielly, 2004). One area of accounting and finance that affects the efficient operations of business organisations in general is working capital management (WCM), among other things (Eljielly, 2004; Shin and Soenen, 1998; Tauringana, and Afrifa, 2013).

WCM has been described as the management of current assets and current liabilities (Agyei and Yeboah, 2011; Tauringana, and AgyapongAfrifa, 2013). Current assets include capital in the form of inventories, physical cash, , account receivables, shortterm financial investments and other current assets (Brealey, Myers and Allen, 2006, p. 813). Current liabilities are made up of the debts to suppliers as account payables, interest payments on long-term debts, short-term loans, accrued income taxes, and, dividend and other current liabilities (Pass and Pike, 2007).

The concept of WCM addresses companies' managing of their short-term capital, which is an important component of corporate financial management, directly affects the profitability and liquidity of both small and large firms (Agyei and Yeboah, 2011; Tauringana, and AgyapongAfrifa, 2013). It has been well noted and accepted that small scale industries contribute immensely to providing job opportunities, nurturing a society

of entrepreneurs and opening up new business avenues for the development of a country.

The global financial crisis in 2008 caused businesses, lenders, insurers and governments to re- re-evaluate their situations, taking steps to protect themselves for now and the years to come. (Global Working Capital Annual Review – GWCAR, 2013). According to the Institute of Statistical Social and Economic Research (ISSER, 2014), this financial crisis has had some significant impact on many African economies including Ghana. According to the GWCAR report, overall, working capital levels have deteriorated year on year by almost 2% globally, a trend that is reflected across all industry sectors. Moreover, globally, the highest levels of working capital are seen in Pharmaceuticals and Manufacturing driven by both high levels of inventory and debtors, and whilst Utilities, Retail and Technology sectors have experienced the greatest deterioration year on year, the greatest improvement was seen in Oil and Gas with an already low level of working capital. (p. 13). Generally, the effects of this is that receivables deteriorate across majority of the sectors, customers are taking longer days to pay debts and borrowings, customers are paying suppliers later, inventory is increasing across majority of sectors, companies are seeing more cash tied up in stock, and payables have increased across all territories.

A study on Belgian firms, suggests that, working capital management has a fundamental effect on the profitability of a firm. The study also indicated that firms have to make a trade-off between liquidity and profitability Deloof (2003). Likewise, Raheman and Nasr (2007), posit that a firm has to determine the balance between liquidity and

profitability because rising profits at the cost of the liquidity of the firm can be harmful in terms of insolvency and bankruptcy of the firm. For that reason, the three components of the cash conversion cycle are each managed in different ways to improve the profitability. This is due to firm specific (industry-wise) with different characteristics.

With the current down turn of world fuel prices and the turbulent economic conditions prevailing in Ghana, coupled with high interest rates, high inflation, fluctuating fuel prices, and the depreciation of the Ghanaian cedi, it is only expedient that resources are wisely managed by firms. Companies have to be conscious and employ the source of funding often neglected by most managers in the form of working capital. For instance, companies could make use of the credit facilities given by their suppliers. WCM is an area of interest that has seen wide coverage by the academia in order to postulate firm's profitability. Many researchers have deliberated on WCM in so many different ways. As some authors focused on the impact, of the optimal inventory management, others looked at the best methods of managing account receivables and account payables that gears towards profit maximisation. (Lazaridis and Tryfonidis, 2006). Similarly, other studies have deduced that reduction of WCM, improves firms profitability. Jose et al (1996). Shin (2007).

In this global economic trend, working capital management has been a top priority of many firms. According to the GWCAR (2013, p. 39), 49% of company boards focus greatly on cash and working capital as top priority for corporate growth strategy. The need for firms to maintain optimum working capital and creating sustainable working

capital is becoming ever more important. Consequently, proper working capital management would enable firms in general, for that matter Ghanaian petroleum companies in particular, sustain business growth, which in turn leads to maximisation of owners' wealth as well as sound liquidity for ensuring effective and efficient customer services. This study will focus on working capital management and profitability analysis among petroleum retailers in Ghana.

## **1.2 Problem Statement**

There is a general consensus in existing financial accounting research that inefficient management of working capital causes failure of small firms (Berryman, 1983), as well as overtrading (Appuhami, 2008), liquidity and profitability problems (Eljielly, 2004; Peel and Wilson, 1996; Shin and Soenen, 1998). In spite of the critical importance of WCM to business organisations in general and petroleum retail companies in particular, very limited research has been conducted to explore WCM in petroleum companies. Most empirical study on WCM are based on large corporate institutions in developed economies (Deloof, 2003; Shin and Soenen, 1998; Tauringana, and Adjapong, 2013).

A relatively few studies have examined WCM in specific small scale industries such as in manufacturing, the retail sector, agriculture among others in developing countries in general, like Uganda (Orobia, Byabashaija, Munene, Sejjaaka, and Musinguzi, 2013), Nigeria (Oladipupo and Okafor, 2013), Zimbabwe (Zawaira and Mutenheri, 2014), and Ghana's financial industry (Agyei and Yeboah, 2011). The findings of previous studies also show major inconsistencies in WCM and profitability relationship (Deloof, 2003; Ganesan, 2007; Gill, Biger, and Mathur,



2010; Islam and Mili, 2012).

No study to the best of the knowledge of the researcher has been done to examine WCM and its impact on profitability in Ghana's petroleum industry. This research will therefore provide empirical evidence on the effect of WCM on profitability in PRF in Ghana, which is an under-researched area of study. Therefore, the main problem of this study is to investigate the extent to which WCM affects profitability of petroleum retail firms in Ghana, the experiential proof on the working capital management and its impact on the firm performance in PRFs also serves as an inspiring force to study the subject matter in detail.

Again, some managers do ignore the organisation's operating cycle thus having extended debtors' collection period and shorter creditors period. All these are the stimulating forces which calls for an investigation, hence the need to study the effects of working capital management on the profitability of PRF in the Kumasi metropolis.

### **1.3 Objectives of the Study**

#### **1.3.1 General Objective**

The main purpose of this study is to assess the impact of working capital management on the profitability of petroleum retail firms (PRF) in the Kumasi Metropolis in Ghana.

#### **1.3.2 Specific Objectives**

For this purpose, the following are the specific objectives of the study:

1. To determine the relationship between inventory days and profitability in PRFs in the Kumasi metropolis.
2. To determine the relationship between accounts payable days and profitability in PRF in the Kumasi metropolis.
3. To determine the relationship between accounts receivable days and profitability in PRF of the Kumasi metropolis.
4. To examine the challenges of working capital management in PRF in the Kumasi metropolis.

#### **1.4 Research Questions**

The following are the research questions for this study:

1. How does inventory days affect profitability in PRFs in the Kumasi metropolis?
2. How does accounts payable days affect profitability in PRF in the Kumasi metropolis?
3. How does accounts receivable affect profitability in PRF in the Kumasi metropolis?
4. What are the key challenges of working capital management in PRF in the Kumasi metropolis?

#### **1.5 Relevance of the Study**

This study has several importance to theory and research in financial accounting relating to WCM. Theoretically, it will be one of the initial studies that provide empirical



findings on WCM and profitability in the petroleum industry in SubSaharan Africa (SSA) and Ghana in particular, since there is lack of empirical studies specifically in the petroleum industry context. In addition, it will contribute to the debate on the relationship between components of WCM and profitability which has generated some diverse and contradictory findings in the literature.

To management of the PRFs, the findings on the challenges facing managers in the PRF will inform them to understand which financial strategies might be most appropriate to use in tackling working capital problems in the petroleum industry in Ghana. Moreover, the findings will provide important financial management policy suggestions and recommendations to managers in the petroleum companies in Ghana regarding some strategies for effective working capital management which are specifically related to the PRF in Ghana.

Furthermore, this study will add to the scarce literature on WCM and profitability in the petroleum industry in general. It will serve as a source of important literature for future research in the petroleum industry in Ghana and SSA.

To the government agencies responsible for the petroleum sector in Ghana, the empirical findings could help them to understand the efficiency of WCM and the challenges associated with WCM among the PRF. This will in turn enable the government agencies to develop appropriate financial instruments and policies to support, facilitate and ensure effective WCM and sustainability of PRF in Ghana.

## **1.6 Brief Methodology**

The basic data used for this study will be taken from the financial statements of 5 petroleum retail firms in the Kumasi Metropolis, over a six year period (from 2009-2013). The choice of these firms is based on convenience since it is difficult getting other companies to release their financial statements for research purpose. The main source of this data was from financial statements of the respective companies used in this study. As part of the agreement for using the data and for ethical reasons, the names of the companies were omitted. Data were analyzed using panel data methodology available in STATA 12.0, within the framework of the random effects technique for the presentation and analysis of findings. Panel data methodology has the advantage of not only allowing researchers to undertake cross-sectional observations over several time periods, but also control for individual heterogeneity due to hidden factors, which, if neglected in time-series or cross-section estimations leads to biased results (Baltagi, 1995).

## **1.7 Scope and Limitations of the Study**

The main limitation of this study is the sample size involved and context of the research. First, only five PRFs in Kumasi Metropolis. Moreover, since the findings are industry-specific, it places some limitation on the generalizability of the findings. This implies that the findings of this study will be limited to only the petroleum retail firms in Kumasi Metropolis and would not represent all the various suppliers of petroleum services in the petroleum industry in Ghana. Thus, it is acknowledged that results of this study

might not be applied to entire Ghanaian retail firms in the petroleum industry in Ghana, and even Kumasi Metropolis.

Although this study aims to provide empirical evidence on petroleum retail firms in Ghana, the scope of the study have been limited to Kumasi Metropolis due to short time for completing this study. The sample consists of five companies in the retail segment of petroleum firms which represent only a relatively smaller percentage of total retail companies operating in Kumasi Metropolis and financial data are based on six (6) fiscal years, from 2009 to 2013.

### **1.8 Organization of the Study**

This study is organised into five chapters. First chapter discusses the importance of working capital management and profitability for the petroleum sector. It also highlights the problem statement, purpose and objectives, research questions, significance, limitations and delimitations and organisation of the study. Chapter two is the review of related literature. It discusses the concept of working capital, working capital management components and measurements, empirical review of research in working capital management, petroleum industry review and conceptual framework and hypothesis for the study. It ends with a chapter summary.

Chapter three is the research methodology. It discusses the research design, population and sampling issues, data collection as well as data analysis methods for this study.

Chapter four is the data analysis and discussion. It presents empirical analysis of data for each research objective and question using the appropriate formulae for each component of working capital management and profitability. This chapter also presents a discussion of the results to address each research question and objective for the study in relation to existing literature in WCM. Chapter five is the summary, conclusion and recommendation. It summarises the study, its key findings and conclusion. It will also presents a recommendations to management of retail firms in the petroleum industry based on the findings for the study.



## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter reviews relevant literature related to this research. It covers a review of the concept of working capital, working capital management components and measurements, profitability empirical review of research in working capital



management, petroleum industry review and conceptual framework and hypothesis for the study. It ends with a chapter summary.

## **2.2 The Concept of Working Capital**

This section discusses the concept of working capital (WC) in terms of its general definitions, justifies a working or operation definition of WC in this study, and discusses the importance of WC to firms, especially petroleum retail firms (PRF).

### **2.2.1 Definitions of WC**

Generally, firms have two types of capital, one for long term needs, called fixed capital and the other for short term or current needs of the firm, termed working capital. Thus, to run the business operations short-term assets are also required. The term working capital (WC) has several meanings in business accounting and finance. From the perspective of accounting and financial statement analysis, working capital is defined as the firm's short-term or current assets and current liabilities (Arnold, 2008; Jeng-Ren, Li, and Han-Wen, 2006). On the other hand, from a financing perspective, working capital refers to the firm's investment in two types of assets, a firm's investment in short-term (current) assets needed to operate over a normal business cycle, and a company's investments in overall non-fixed assets that are not often measured on the balance sheet such as investment in product redesign or formulation of a new marketing strategy (Bevan and Danbolt, 2002; Sogorb-Mira, 2005). Thus, working capital can represent a broader view of a firm's capital needs that includes investment in both current assets and other non-fixed asset investments

related to its operations. This study focuses on the accounting and financial statement analysis perspective of WC, which focuses on current assets and current liabilities measured on the balance sheet.

In the chosen perspective of WC, there are two further meanings or perspectives of working capital, gross working capital and net working capital. Gross working capital is a quantitative perspective which defines WC as the total current assets of a firm (Khan and Jain, 2007), while net working capital is a qualitative perspective which defines WC as the excess of current assets over current liability of a firm (Khan and Jain, 2007). Net working capital, therefore, represents the amount of current assets that would remain if all current liabilities of a firm are paid for. These two perspectives of WC have their respective areas of significance. The „Gross concept“ is useful where the purpose of financial management is to measure the size and extent to which current assets are being used, whereas „Net Working Capital“ is preferable and useful where the aim is to evaluate the liquidity position of an undertaking.

In this study, since the focus is on analysis of WC and profitability relationship which is part of the liquidity of a firm, it becomes appropriate and useful to adopt the Net concept of WC (NWC). Thus NWC as used in this study refers to Net working capital, which is defined as “the difference between current assets and current liabilities” (Arnold, 2008, p. 515). By implication, NWC is mathematically represented as:

$$\text{Net Working capital (NWC)} = \text{current assets (CA)} - \text{current liabilities (CL)} \quad (1)$$



This choice of definition is also consistent with many studies that examined the impact of WC management on liquidity, profitability or productivity of companies (Abosedo and Luqman, 2014; Agyei and Yeboah, 2011; Lazaridis and Tryfonidis, 2006; Orobia et al., 2013; Tauringana and Adjapong, 2013).

In NWC, current assets consist of capital in the form of short-term financial investments, cash, account receivables, inventories, and other current assets (Brealey, Myers and Allen, 2006, p. 813). These are further grouped as assets used in companies' day-to-day operations that are expected to provide the company cash in return within a year. The short-term investments can be better for companies because they could be converted to cash faster (Raheman and Nasr, 2007). In NWC, current liabilities include accrued income taxes, short-term loans, the debts to suppliers as account payables, and interest payments on long-term debts, dividend and other current liabilities (Pass and Pike, 2007). Current liabilities is an external financing for companies and they are particularly crucial for small and medium enterprises like the PRFs that may find it difficult getting long-term loans (Teruel and Martı́nez-Solano, 2007).

### **2.2.2 Importance of WC**

The importance of NWC to the success of business in general and petroleum retail firms. NWC is an indicator of the firm's ability to meet its short term financial obligations (Arnold, 2008; Brealey and Myers, 2002), and represents companies' management of their short-term or current capital, usually lasting for one accounting year (Jeng-Ren et al., 2006). As NWC represents a firm's net investment in short term assets that are continually flowing (circulating) into and out of the business, they constitute an

essential financial management area for day-to day operations (Atrill, 2006; Khan and Jain, 2007). NWC is needed for several uses in petroleum retail firms (PRF).

First, WC provides a continual investment in short-term assets that a PRF needs to operate. A PRF needs to keep a minimum amount of cash balance to help cover its basic day-to-day operations and to provide a reserve for unplanned costs. A PRF also needs NWC for prepaid business costs, such as insurance policies, licenses, or security deposits. In addition, all types of firms make some investments in inventory. NWC are thus seen as fundamentally the lifeblood of a company in general, without which PRF in particular cannot survive in business (Arnold, 2008; Atrill, 2006; Khan and Jain, 2007).

Second, NWC is used to address seasonal or cyclical financing needs as a means of providing liquidity to ensure that current asset of PRFs is appropriately financed in to avoid bankruptcy or insolvency. Third, NWC is needed to sustain a firm's growth. As a business PRFs grow, they need larger investments in inventory, accounts receivable, personnel, and other items to realize increased sales. Finally, NWC is used to undertake activities to improve business operations in PRFs and help them remain competitive, such as product development, ongoing product and process improvements, and cultivating new markets (Khan and Jain, 2007).

## **2.3 Working Capital Management**

This section discusses the concept of working capital management (WCM) in terms of its general definitions, and discusses the importance of WCM to firms, especially petroleum retail firms (PRF).

### **2.3.1 Concept of Working Capital Management**

Managing working capital is perceived as an aspect of financial management. Hofmann and Kotzap (2010) maintains that the management of working capital includes all aspects of the administration of current assets and liabilities. WCM is intended to minimize the capital to be tied up in the company's turnover process by reducing current assets and extending current liabilities. Gitman (2009) maintains that the objective of WCM is to minimise the Cash Conversion Cycle (CCC). The CCC is the period during which a company makes cash payment to suppliers and its receipt from customers based on the company's WCM policies (Gitman, 2009).

WCM is aimed at controlling debtors, the process of debt collection, and managing inventory. WCM is crucial for the survival and sustainability of business, and its direct effect on firm performance. In essence, managing net working capital is the process of ensuring that the firm maintains an optimal level of current assets in order to cover its current liabilities (Jeng-Ren, et al., 2006).

### **2.3.2 Levels of WCM**

There are at least three levels of outcomes of working capital management and their implications. Generally, estimating the NWC can be used to describe how effective companies have managed their short-term obligations. Where companies are able to manage both expected and unexpected financing of expenditure without having any financial stress (Maness and Zietlow, 2005, p. 28).

Where companies generate more current assets than liabilities a positive net working capital occurs and the excess of current assets can be used to fulfil their financial commitments and obligations to shareholders in order to sustain the growth of any business firm (Lantz, 2008, p. 113). Where CL is more than CA, a negative NWC occurs which implies that the company is not able to generate adequate capital for meeting its short-term financial obligations. This situation is not good for most companies as it is a condition that also affects profitability of a firm and cause its eventual bankruptcy. In order to avoid persistent negative WCM, firms can use credits or sell off short-term assets to get capital for payments (Maness and Zietlow, 2005, p. 5-9).

### **2.3.3 Components and Strategies for WCM**

In facilitating WCM, strategic managers use various approaches to enable them monitor their optimal WC levels. CCC is one of the most used measures in WCM analysis, which has four main components (Arnold, 2008; Gitman, 2009), which are inventory management, accounts receivables, cash management and accounts payables. These CCC components are discussed briefly below:



**Inventory management:** Inventory consists of three components, namely, finished goods, raw materials, and work-in-progress (WIP) (Arnold, 2008; Cinnamon, Helweg-Larsen, and Cinnamon, 2010). Inventory management is concerned with ensuring that inventory is converted to cash immediately without running out of stocks (Arnold, 2008). One technique that helps ensure effective inventory management is the Just-in-time approach, which means that inventories are kept to a bare minimum and optimizing the supply chain process to serve so that the inventories never exhaust (Brealey, Myers, and Allen, 2006; Cinnamon et al., 2010; Gitman, 2009).

**Accounts Receivables Management (Debtors).** Accounts receivables represent payments to be made by customers who owe the firm for goods and services the firm has provided them. Accounts receivables management aims at minimising the timelapse between completion of sales and receipt of payment. Effective accounts receivables management depends, to a large extent, on effective credit management.

To achieve increase sales, customers should be given credit transaction policy and efforts should be made to reduce or eliminate delay in payment through the use of factoring. A factor is a professional debt collection company. Effective credit management would help a firm meet its financial obligations (Brealey et al., 2006; Cinnamon et al., 2010; Gitman, 2009).

**Cash Management.** Cash management has to do with the most liquid of assets including demand deposits, bank notes and coins, money market accounts and currency holdings. Cash management aims at ensuring that there is optimal level of cash required for business operations and invested in marketable security (Gitman, 2009). Cash

management refers to forecasting and budgeting cash inflows and outflows, and ascertaining optimal cash and near-cash balances (Gitman, 2009). The main cash management elements include cash administration of cash receipt, disbursement, forecasting, internal controls and balances management, (Gitman, 2009).

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***Accounts Payables (Creditors).***Accounts payables are the creditors a firm owes and must pay them for good and services received from the suppliers (Gitman, 2009). Accounts payable management aims at ensuring that the firm delays in paying creditors while ensuring that they do not tarnish their credit worthiness.

Weinraub and Visscher (1998) also presented a framework for understanding working capital in terms of risk and return tradeoffs in relation to the appropriate strategies for WCM. They classify WCM strategies into three categories, being aggressive, moderate and conservative. The aggressive category represents the situation where working capital financing and investment are characterized by high risk and high returns. On the other extreme end is the moderate category which is characterized by lower risk and returns. Finally, conservative WCM strategies are characterized by the lowest risk and return ratios.



## **2.4 Approaches for Measurement of WCM**

According to Maness and Zietlow (2005, p. 25), companies can approach working capital measurement for three concepts, namely solvency, liquidity and financial flexibility. Each approach discussed with its advantages and disadvantages.

### **2.4.1 Solvency Measures**

WCM can be measured using solvency measures. While some firms have sufficient cash funds available to meet their daily needs, others rely on overdrafts or borrowings and others sources to finance their assets (Bender 2009, p. 330). Two solvency measures of a firm is the CR and the NWC both of which measure CA and the CL relationship in order to determine the financial strength of a firm to meet short-term obligations. As already defined earlier in this thesis, NWC represents CA minus CL.

NWC is a holistic measure that determines the efficiency of a firm's short-term obligations. In spite of its simplicity, it is inappropriate to use the NWC to compare the WC performance between companies in different sizes. Maness and Zietlow (2009) maintain that the NWC might not be the most reliable measure as the CA and CL are combined with financial and operational strategies. Combining financial and operational strategies into an absolute term makes NWC to give a bias estimate of a company's liquidity. Therefore, the financial and operational strategies should be separated to give a better measure of solvency (Maness and Zietlow 2005, p. 28-29).

### 2.4.2 Liquidity measures

Liquidity refers to how much capital a company has for the purpose of investment and expenditure. While some companies may have enough cash funds available to cover their day-to-day expenditure, others rely on overdrafts or borrowing facilities or a form of asset finance (Bender 2009, p. 330).

Liquidity is commonly measured by cash conversion efficiency, operational cash flow, and the CCC. The cash flow from operations measure is estimated from the addition of net profit to depreciation, long-term deferrals, and amortization. This appears to be a better measure when making longitudinal comparisons, rather than over just one year. This is because a result for a single year could be influenced by market or situations and provide misleading outcomes.

The cash flow cycle measure takes the time aspect in account, which makes it beneficial as it provides managers a more realistic liquidity estimate (Maness and Zietlow 2005). The measures for CCC includes the ADR, ADI and ADP. A short cash conversion cycle is preferable as it can provide an effective way of analyzing a firm's WCM. One set back with this measure is that it ignores the management of in and out payments that most companies have and which might add some days in the cycle.

In view of this weakness, the number of days should be withdrawn to give a more accurate picture of WCM than its inclusion does. In spite of this minor flaw the cash

conversion cycle remains a popular, widely used measure of WCM for estimating the liquidity of firms (Maness and Zietlow 2005, p. 35-37).

#### **2.4.3 Financial flexibility measures**

The third approach to WCM measurement is the use of financial flexibility. Financial flexibility demonstrates how practically real firms' financial regulations are associated with their growth ability. In this case a company's growth is measured in terms of sustainable growth rate, which is estimated as the ratio of earnings on shareholders' equity to the firms' net profit.

A firm's ability to grow without too much liquidity difficulties will depend, to a large extent, on the sustainable growth rate. An increase in the growth rate may indicate that a firm has accrued adequate profits to meet its short-term expenditure and manage its new investments, while a decrease in growth rate may suggest a situation where a firm has relatively small cash flow receipt to pay off their expenditure.

For the purpose of this study, the liquidity approach has been chosen. This would involve measures such as the CCC, as a measure of working capital management. The CCC indicates the duration a company takes to make cash payments to creditors and to collect its debts from debtors based on the company's regulations on ADI and ADP. Therefore, the liquidity approach is chosen as the most appropriate for this study.

## 2.5 Metrics for Liquidity Measures of WCM

In addition to the NWC, the cash conversion cycle will be used as the liquidity measure of WCM.

### 2.5.1 The cash conversion cycle

The cash conversion cycle (CCC) The CCC indicates the duration a company takes to make cash payments to creditors and to collect its debts from debtors based on the company's regulations on ADI and ADP (Gitman, 2009). The CCC will depict the average number of days it will take for capital to be converted to cash in the cycle (Gitman, 2009). According to Gitman (2009), it is even preferable to have a shorter conversion cycle with a low or even negative number of days for profit since it can help reduce the need for external financing (Gitman, 2009).

The CCC is estimated as:

$$CCC = ADI + ADR - ADP, \text{ where}$$

ADI = Average number of days inventory

ADR = Average number of days accounts receivable

ADP = Average number of days accounts payable

#### ***Average number of days inventory (ADI)***

ADI estimates the value of inventory, which is given by days of outstanding cost of goods sold. The ADI represents the period it takes to convert inventory into revenue.

According to Banomyong, 2005, the ADI is given by



$$ADI = \frac{\text{Average inventory}}{\text{Cost of Goods sold}} \times 365$$

***Average number of days accounts receivable (ADR)***

ADR represents the number of days for outstanding revenue in the balances (receivables). The ADR's effectiveness depends on effectiveness of credit management and/or debt collection management. According to Banomyong, 2005, the ADR is estimated as:

$$ADI = \frac{\text{Average Accounts Receivable}}{\text{Credit Sales}} \times 365$$

***Average number of days accounts payable (ADP)***

ADP represents the number of days of outstanding payments to suppliers at the end of the period. It shows how many days it takes a company, averagely, to pay out its debt to suppliers. According to Banomyong, 2005, the ADP is estimated as:

$$ADP = \frac{\text{Average Accounts payable}}{\text{Credit Purchases}} \times 365$$

A summary of the liquidity measures of WCM are presented in Table 1.

Table 1 Summary of Liquidity WCM metrics

Metric	Formula
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ADI	
ADR	$\frac{\text{average inventory}}{\text{cost of Goods sold}} \times 365$
ADP	$\frac{\text{average Accounts Receivable}}{\text{Credit Sales}} \times 365$
CCC	$\frac{\text{average Accounts payable}}{\text{Credit Purchases}} \times 365$
$CCC = ADI + ADR - ADP$	

---

## 2.6 Concept and Measurement of Profitability

Profit is a gain from investing into a business operation after accounting for all expenses. In another sense, the excess of price over costs of transactions of an enterprise. This cost-price relationship could arise from any economic activity such as harvest, extraction, manufacture, or purchase (Arshad and Gondal, 2013). In the accounting literature profitability can be measured using Return on Assets (ROA) and Return on Equity (ROE). ROE ratio has been used by several authors in the financial literature (Adjei and Yeboah, 2011; Akoto, Awunyo-Vitor, and Angmor, 2013; Gatsi and Akoto, 2010) to proxy firms' profitability. ROE is estimated as net profit divided by total asset.

ROE measures how effectively a company's management manages shareholders' funds to maximize shareholder wealth. ROE indicates the rate at which the company's value grows at an appreciable level. ROE is estimated as:

$$\frac{\text{Annual net income}}{\text{Average shareholders' equity}}$$

Return on Assets (ROA) measures management's effectiveness in managing the company's resources in terms of how much profit a company earns for its assets. ROA is calculated as operating profit as a ratio of both fixed and non-fixed assets at the end of the accounting year (Taurigana and Adjapong, 2013). That is profit before deducting tax interest for a particular accounting year. ROA could be estimated as:

$$\frac{\text{Annual net income}}{\text{Total assets}}$$

The only difference between ROA and ROE is about accounting for liabilities. Liabilities in terms of financial leverage or debt is the key factor that distinguishes ROE from ROA. In other words, ROE estimates only net income and does not include financial leverage of a firm, whereas ROA accounts for financial leverage of a firm.

The balance sheet's fundamental equation shows how this is true:

$$\text{Assets} = \text{liabilities} + \text{shareholders' equity}.$$

Therefore, ROE could be used as reasonable measure of profitability where ROA is sound and the company has reasonable debt levels. On the other hand, in situation where ROA is low or the company is servicing huge debts, then a high ROE can give shareholders a misleading picture about the company's sustainability or prospect. In view of the advantages of ROA over ROE, this study adopts ROA as a measure of firm's profitability.

## **2.7 Empirical Review WCM and Profitability Relationship**

Extant literature has examined the relationship between WCM and firm performance and/or profitability within different industry contexts. Shin and Soenen (1998) studied the relationship between working capital management and value creation for shareholders. Using sample of 58,985 firm years covering the period 1975-1994, and correlation and regression analysis by industry and working capital intensity, the authors found that a strong negative relationship between the length of the firm's nettrade cycle (NTC) and its profitability. Their findings suggest that one possible way to create shareholder value is to reduce firm's NTC.

In the study of Wang (2002), it was found that there is a negative relationship between profitability and accounts receivable and reducing inventories. Thus, a shorter Cash Conversion Cycle (CCC) and net trade cycle improve firms' performance. They further conclude that efficient working capital management is very important to create value for the shareholders. Deloof (2003) also found that corporate profitability is strongly related significant the measures of WCM. Their findings suggest that by reducing the number of days of accounts inventories and receivable, managers can increase profitability considerably.

Lazaridis and Tryfonidis (2006) studied the relationship between corporate profitability and WCM for 131 firms listed in Athens Stock Exchange during period 2001 to 2004.

They found a statistically significant and negative relationship between operating profit and CCC. Their study imply that managers can increase profit by effectively managing individual components of working capital to an optimal level.

Raheman and Nasr (2007) researched into the corporate profitability and WCM relationship for 94 firms listed on Karachi Stock Exchange during 1999-2004 in Indian. It was found that a negative relationship exists between WCM measures and profitability. On the contrary, the findings of Sharma and Kumar (2011) appears to be significantly different from the various international studies conducted in different markets, which found that WCM and profitability is positively related. The study further reveals that the relationships between profitability and number of days inventory and number of days accounts payable are negative, whereas there is a positive relationship between profitability and number of days accounts receivables and CCC. Their study focused on a sample of 263 non-financial BSE 500 firms listed at the Bombay Stock (BSE) from 2000 to 2008, using OLS multiple regression.

Uyar (2009) studied the relationship between CCC and profitability using data from small and large firms quoted on the stock exchange market at Istanbul. The results indicated that retail and wholesale industry has shorter CCC than manufacturing industries because retail and wholesale industry do not usually practice credit sales but cash sales. Furthermore, it found that CCC is negatively correlated with profitability.



Falope and Ajilore (2009) studied the impact of WCM on firm profitability using data for fifty Nigerian non-financial quoted firms on Nigerian Stock Exchange during period 1996 to 2005. Using time series and cross sectional observations in a pooled regression to estimate, the authors examined the relationship between working capital measures and firm's profitability. Their findings indicated that the relationship between profitability and all working capital measures is significantly negative. They also found that no significant variations in WCM and profitability existed among between large and small firms.

Gill et al. (2010) studied the relationship between WCM and profitability using American firms quoted on New York stock exchange from 2005 to 2007. Using data from a sample of 88 American firms, the authors found statistically significant relationship between working capital management and firm's profitability. They further found that ADR is negatively related to firm profitability, but CCC positively related to profitability. Their findings imply that managers can improve profitability of their respective firms by effective management of CCC and by ensuring that accounts receivables are kept at the most appropriate level. Also, less profitable firms should pursue a decrease in their accounts receivables to reduce the cash gap in CCC.

Taurigana and AdjapongAfrifa (2013) studied the relative importance of WCM among 133 SMEs in the UK for the period 2005 to 2009. Using panel data regression analysis of a sample of 133 firms, their results show that the management ADP and



ADR is important for SMEs profitability. However, Generally, CCC and WCM relationship was non-significant. The relationship between ADI and ROA was negative but not significant. ADR was negatively related to profitability significantly and that ADP is negatively associated with profitability. Regarding relative importance, ADR management was rated top most priority, followed by ADP, ADI and CCC. Their study was limited to AIM listed SMEs, and therefore the findings lacks generalisability to all companies. They suggest that the SMEs need to concentrate their limited resources on managing AR and AP in order to be more profitable.

Vishnani and Shah (2007) investigated the role of WCM on firm performance and the importance of a tradeoff between liquidity and profitability using Indian consumer electronic industry for the period 1994-1995 to 2004-2005. The results did not support those of previous research that established a relationship between liquidity and profitability. Rather their results show the relationship between WCM and profitability may vary among companies in the same industry. They found that for most of the companies, there exists a positive relationship between liquidity and profitability. Their findings also indicate a negative relationship between WCM and profitability.

A relatively few studies examined WCM and profitability relationship in the context of Africa and Ghana in particular. Oladipupo and Okafor (2013) examined the relationship between WCM and firm profitability and dividend payout ratio in Nigeria. Using financial data obtained from twelve manufacturing companies quoted on the Nigeria

Stock Exchange over five years period (2002 to 2006), the results of Pearson product moment correlation technique and ordinary least square (OLS) regression technique indicated that shorter net trade cycle and debt ratio promote high corporate profitability. They further found that while the level of leverage has negative significant impact on corporate profitability, the impact of working capital management on corporate profitability appears to be statistically insignificant at 5% confidence level. Also, dividend payout ratio was influenced positively by profitability and net trade cycle but negatively by growth rate in earnings. Moreover, the impacts of both corporate profitability and working management on the dividend payout ratio appear to be statistically insignificant at 5% confidence level.

Stephen and Elvis (2011) examined the effect of WCM on firms profitability using SMEs in Kenya. Using fixed panel data of 232 firms, the results indicated that the average days receivables, average days of inventory and the CCC significantly affected the firms' profitability positively. This implied that SMEs in Kenya appear to be adopting conservative WCM policy. The firms needed to concentrate and improve their collection and payment policy. The findings also imply that the effective WCM policy formulation can positively affect manufacturing firms' operating profitability. They recommended that, for efficient working capital management, specialized persons in the fields of finance should be hired by the firms for expert advice on working capital management in the manufacturing sector.

Adjei and Yeboah (2011) studied how WCM practices are related to profitability of banks in Ghana. Using panel data from 28 banks, over a ten year period (from 1999-2008), the findings indicated appeared to be inconsistent with some previous research on WCM and profitability relationship. They found that CCC and ADR were positively related to bank profitability, while ADP was negatively related to profitability. Also, credit risk, exchange risk, capital structure and size significantly increase bank profitability. They however found that firms that are quoted on the Ghana Stock Exchange seem to perform worse than their unlisted counterparts.

Akoto et al. (2013) studied the relationship between WCM and profitability of listed manufacturing firms in Ghana, using 13 manufacturing firms quoted on Ghana stock exchange spanning the period from 2005 to 2009. Using secondary data collected from all the 13 firms, the results shadowed a significantly negative relationship between profitability and accounts receivable days. However, there was a positively significant relationship between the firms' profitability and WCM factors such as CCC, firm size, and current asset turnover, and current asset ratio. The authors used return on equity as an approximation of profitability instead of return on assets. Their results suggest that managers can improve shareholders' wealth by putting in measures to reduce their accounts receivable to 30 days. Moreover they recommend that there should be establishment domestic regulations that protect local firms and prevent the activities of importers to promote increase demand for locally manufactured goods in Ghana.

There is very limited research in WCM and profitability relationship in the petroleum industry. Aruldoss, Rajan, Jesus Raj, Mohamed Mohideen (2013) explored WCM of an

Indian petroleum company from 2010-2011. Their findings show decrease in working capital for the firm in question but the profitability of the business shows a positive trend in favour of the company operations as it reflected in a positive working capital of the company.

Shah and Sana (2005) studied the impact of WCM on the profitability of oil and gas sector of Pakistan using seven listed firms companies for a five year period, 2001 to 2005. Applying correlation and Ordinal Least Square method using Fixed Effect Estimation model, the authors found a non-significantly negative relationship between gross profit margin and number of days inventory and number of days accounts receivable, but a positive, non-significant relationship between profitability and cash conversion cycle and sales growth.. According the authors, the results show the existence of firm effect indicates the different management styles of the companies and different working capital needs. They believe that negative CCC is due to outstanding payments of bills on time. That is why the payment cycle is longer than operating cycle. They also found sales growth to be negatively related to profitability, indicating abnormal results. However, this does not seem abnormal in Oil and Gas Sector as the initial investment is capital intensive.

Similarly, Raza, Bashir, Latif, and Shah (2015) further examined the impact of working capital management on profitability in Pakistan oil sector using five companies for a five year period, 2006 to 2010. The authors provided a descriptive analysis of the current ratio, liquidity ratio and profitability ratios of the various companies studied but did not use a regression analysis to test the impact of WCM on profitability directly.



Sarkar and Sarkar (2013) researched into the impact of WCM on corporate performance in some selected public sector oil and gas companies in India during the period of 10 years (i.e. from 2000-01 to 2009-10). The authors used return on capital employed as a measure of profitability. Using descriptive and correlations analysis, they found that out of selected eight ratios, current ratio, current assets to total asset ratio and inventory turnover ratio for the six selected companies have the significant influence on the overall profitability of the concerned company from 2001 to 2010.

Again, the study of associations between Return on Equity and Performance Index, Utilization Index and Efficiency Index for the selected companies under study, have registered both positive and negative relationships, but these associations are not statistically significant at 0.05 and 0.001 levels of significance during the given study period. They found that the WC leverage ratios of the selected companies under study were fluctuating in nature during the study period and were less than unity during the study period.

In spite of some inconsistencies in findings, generally, much of the existing literature indicate that where a firm is unable to effectively manage its WC, the firm is likely to experience reduced profitability and other financial problems. Both low and high working capital might be disadvantageous for a business concern. While high net working capital can result in unused funds, which could be invested in other profitable ventures, the low net working capital could disrupt business operations and will also adversely affect profitability (Chowdhary and Amin, 2007).



## 2.8 Conceptual Framework and Hypothesis

Based on the review of literature on the relationship between WCM and profitability of firms in general, the conceptual framework for the study is developed (see Figure 1) and the hypotheses underlying the proposed relationship between WCM and profitability are discussed for empirical testing.

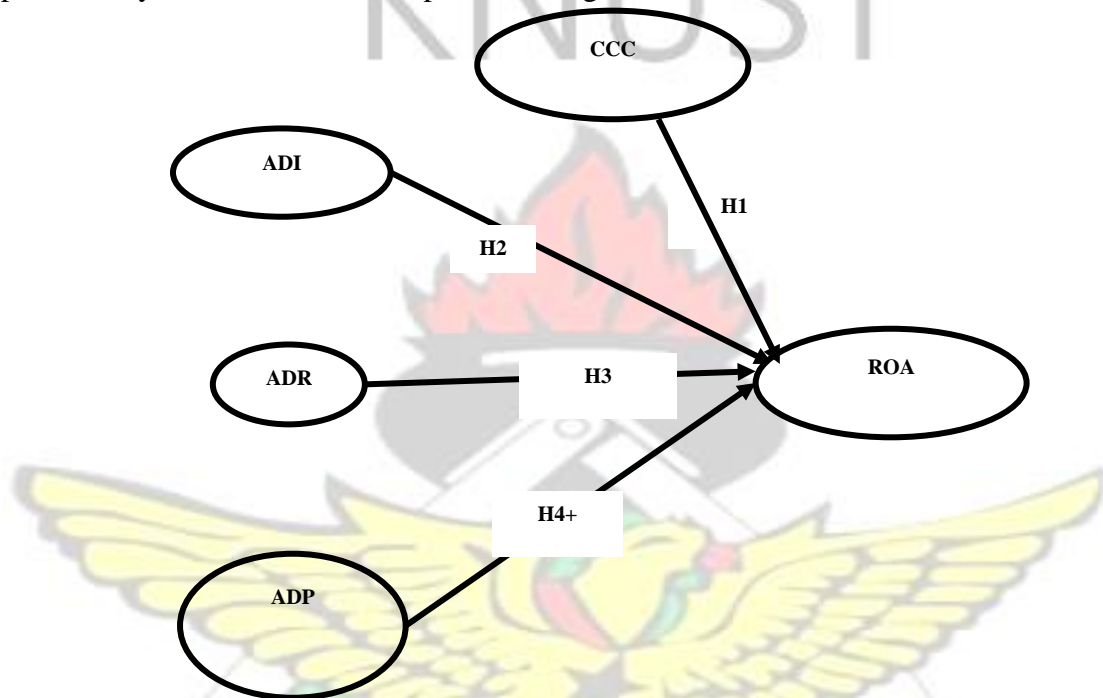


Figure 1. Conceptual framework and hypotheses

Notes: CCC – Cash conversion cycle; ADI - Average number of days inventory, DR - Average number of days accounts receivable; ADP - Average number of days accounts payable

### 2.8.1 Cash Conversion Cycle and Profitability Relationship

WCM and profitability relationship might depend on the firm's WCM strategy (Garcia-Teruel and Martinez-Solano, 2007; Nazir and Afza, 2009; Tauringana and AdjapongAfrifa, 2013). According to Tauringana and AdjapongAfrifa (2013, p. 456) a firm that adopts an aggressive WCM approach, usually has a negative relationship

between components of WC and profitability, and should expect that ADP and profitability are positively related. For the conservative approach, it is expected that CCC, ADI, ADR and profitability will be positively related, and expect that ADP and profitability are negative related.

The type of WCM strategy adopted by management might explain the contradictions of findings of previous studies on how WCM components are related to profitability. Previous studies examining how CCC and its components are related to profitability reveal inconsistent findings. Some previous studies found negative relationship between WCM and CCC (Akoto et al., 2013; Lazaridis and Tryfonidis, 2006; Falope and Ajilore, 2009), which supports the aggressive approach to WCM. On the other hand, a positive and significant relationship was reported by Sharma and Kumar (2011), Gill et al. (2010), and Adjei and Yeboah (2011), which supports the conservative strategy of WCM. Since the type of WCM strategy of petroleum retail firms used in this study is not known, it can only be expected that there is a significant relationship between WCM and profitability for the firms, but the direction of the relationship cannot be predetermined as used in previous studies (Tauringana and AdjapongAfrifa, 2013, p. 457). This leads to the hypothesis that:

H1: There is a significant relationship between cash conversion cycle and profitability.

### **2.8.2 Average number of days inventory (ADI) and Profitability Relationship**

There is also some contradictory findings on the relationship between ADI and profitability. In terms of inventory holding, some previous studies (Raheman and Nasr, 2007 and Nobanee, 2009) found that profitability and inventory holding component (ADI) of WCM are positively related, which is in line with the conservative

approach to WCM. Tauringana and AdjapongAfrifa (2013) even found no significant relationship between ADI and profitability. However, Deloof (2003), Raheman and Nasr (2007), and Falope and Ajilore (2009) all found that ADI and profitability are negatively and significantly related which suggests the aggressive approach to WCM. Since the type of WCM strategy of petroleum retail firms used in this study is not known, it can only be expected that there is a significant relationship between inventory holding (ADI) and profitability for the firms, but the direction of the relationship cannot be predetermined as used in previous studies (Tauringana and AdjapongAfrifa, 2013, p. 457). This leads to the hypothesis that:

H2: There is a significant relationship between inventory holding period (ADI) and profitability.

### **2.8.3 Average number of days accounts receivable (ADR) and Profitability Relationship**

The relationship between accounts receivable and profitability are also contradictory. For example, some past studies found that profitability and accounts receivable component (ADR) are positively related, which is in line with the conservative approach to WCM (Raheman and Nasr, 2007; Nobanee, 2009). Conversely, the findings of Deloof (2003), Raheman and Nasr (2007), Falope and Ajilore (2009) and

Tauringana and AdjapongAfrifa (2013) show that ADR and profitability are negatively related, which suggests an aggressive approach to WCM. Given that the type of WCM strategy of petroleum retail firms used in this study is unknown, it is expected that the

relationship between profitability and ADR will be significant, but the direction of the relationship cannot be predetermined (Tauringana and AdjapongAfrifa, 2013, p. 457).

This leads to the hypothesis that:

H3: There is a significant relationship between accounts receivable period (ADR) and profitability.

#### **2.8.4 Average number of days accounts payable (ADP) and Profitability**

##### **Relationship**

Regarding ADP, existing research shows contrasting findings for the relationship between ADP and profitability. For example, some past studies found that ADP and profitability are positively related which is in consonance with the aggressive approach to WCM (Raheman and Nasr, 2007; Tryfonidis and Lazaridis, 2006). In contrast, the findings of Deloof (2003), Karaduman et al. (2010), and Tauringana and AdjapongAfrifa (2013) support that profitability and ADP are negatively related, which suggests a conservative approach to WCM. Based on this review, it is not really obvious to determine whether aggressive or conservative approach to WCM are associated with profitability positively or negatively.

Given that the type of WCM strategy of petroleum retail firms used in this study is unknown, it is expected that the relationship between ADP and profitability will be significant, but the direction of the relationship cannot be predetermined (Tauringana and AdjapongAfrifa, 2013, p. 457). This leads to the hypothesis that:

H4: There is a significant relationship between accounts payable (ADP) and



profitability.

## **2.9 Brief Review of Petroleum industry in Ghana**

In 2004 Ghana began her offshore oil exploration by selling its licenses for exploration to different international companies (Kastning, 2011). According to the ministry of energy (MoE), in July 2007, Tullow Oil and Kosmos Energy discovered oil and gas in commercial quantities in the western region of Ghana in two blocks:

Deepwater Cape Three Points and Deepwater Tano. They named the area “Jubilee Field”.

According to estimates findings from Offshore-Technology.com (2011), the Jubilee field can be found in the Gulf of Guinea, 60 km off the Ghanaian coast, near the Côte d’Ivoire border. The size of the oil field is 110 km<sup>2</sup> (Offshore-Technology.com, 2011).

Development of the production site started right away and in December 2010 oil production was officially launched. Since 2007 further discoveries have been made.

The Tweneboa field seems to be a second major discovery. Appraisals conducted indicate that the field contains expected recoverable reserves of about 800 million barrels of light crude oil, with an upside potential of about 3 billion barrels (GNPC, 2008; Kastning (2011).



The discovery provides Ghana an opportunity to reduce foreign exchange requirements for the importation of crude oil and also to increase export earnings significantly. The main strategic goal of the MOE is to sustain exploration, development and production of the oil and gas endowment and also the judicious management of the oil and gas revenue for the overall benefit and welfare of all Ghanaians, present and future as well as attract increased local value-added investments in the oil and gas sector and the indigenization of knowledge, expertise and technology. The major challenges for the upstream petroleum sub-sector are how to develop the oil and gas industry with optimal local content and participation, and effectively manage the potential revenue from oil and gas production, and ensure security for the industry as a whole.

According to the Ministry of Energy (2010, p. 24-28), in a report on Energy sector strategy and development plan, the Jubilee crude oil is light and sweet. For oil refiners lightness and sweetness indicates high quality. Independent laboratory analysis says that the crude oil has an API Gravity of 37.6 degrees and a sulphur content of 0.25 % (weight), with no unusual characteristics. Crude oils of this type are attractive for worldwide refineries and can compete with the international price reference oils. Therefore Jubilee oil will be sold for the official oil price. Apart from Crude oil, there are large quantities of other petroleum products such as Gasoline (756,956 45,196 – 66,196), Diesel (1,362,470 242,281 - 344,281), Kerosene (/ATK 214,549 118,914 - 222,015) and LPG (Low Pressure Gas) (220,603 65,451 – 76,251).

In the upstream in the petroleum industry, there are relatively few extraction companies while in the downstream there are many intermediary companies operating petroleum retail firms. Tullow Oil and Gas is an independent Irish exploration and production company, quoted on the London and Irish Stock Exchanges. In 2004 it acquired Energy Africa. Its headquarters are in London and it runs two offices in Accra. Kosmos Energy is an independent American Oil and Gas Exploration and Production Company. It was founded in 2003 by five partners. Anadarko Petroleum Corporation is one of the world's largest independent oil and gas exploration and production companies, quoted on the U.S. Top 500 Stock Exchange. Anadarko has its headquarters in The Woodlands, Texas, U.S. They do not have an office in Ghana. The Ghana National Petroleum Corporation (GNPC), which belongs to the Ghana government, was formed in 1985. It is regulated by the national petroleum authority (NPA) in Tema, Ghana. It owns a 10% interest in the various Ghanaian offshore blocks. Therefore a 10% carried interest in the Jubilee field belongs to them. The GNPC runs the Tema Oil Refinery. (GNPC, 2011). Another extraction company is The EO (Edusei - Owusu) Group was formed in 2002, by the Ghanaians Dr. Kwame Barwuah Edusei and George Owusu.

In view of the potential of the petroleum industry in Ghana, it has attracted a lot of retailing operations. Without effective WCM retailing firms in the petroleum industry in Ghana would find it difficult to make profit and survive. The tendency for some managers to ignore the organisation's operating cycle thus having extended debtors' collection period and shorter creditors' period can have adverse effect on WCM and profitability of the PRFs in Ghana.

## **2.10 Chapter Summary**

This chapter has reviewed relevant financial management literature regarding WCM and profitability relationship. In this study, WC is defined as net working capital (NWC), which is the difference between a firm's current assets and current liabilities. NWC provides the ongoing investment in short-term assets that a PRF needs to operate, helps address seasonal or cyclical financing needs as a means of providing liquidity to ensure that current asset of PRFs is appropriately financed in to avoid bankruptcy or insolvency, helps sustain a firm's growth and to undertake activities to improve business operations in PRFs in order to be competitive. Profitability is measured in terms of return on assets (ROA).

Empirical review of findings on WCM and profitability shows contradictory findings, probably because the relationship depends on the type of WCM strategy chosen by management of the firm. Based on the review, a conceptual framework and hypotheses are developed for empirical testing. Finally, a review of the petroleum industry in Ghana shows that it is financially attractive and has potential for growth, which would also depend on the effectiveness of WCM by the petroleum retail firms in the industry.

## **CHAPTER THREE**

### **METHODOLOGY**

### **3.1 Introduction**

In this chapter all the methods and procedures used in collecting and analyzing of data are discussed and every step taken is justified. It covers areas such as population, sampling, research instruments, data collection procedure, and data analysis tools.

### **3.2 Population and Sampling**

The target population of this study was all registered petroleum retail firms in the Kumasi Metropolis who have prepared their audited financial statements for six years from 2008 to 2013. A sample of five selected firms were taken for this study. The data were taken from the companies but the names of the companies will remain anonymous in the research work. In order to ensure ethical research, the researcher assured them of the anonymity of their identity (Cooper and Schindler, 2006). The choice of these firms was based on convenience since it was difficult getting other companies to release their financial statements for the research purpose.

### **3.3 Data Analysis Methods**

Data was analyzed using descriptive analysis, correlation, and panel data methodology available in STATA 12.0. The descriptive analysis involved the use of means, standard deviation, median and percentages to describe the dependent, independent and controlled variables for this study. The correlation coefficients using Pearson correlation was presented for all dependent and independent variables such as CCC and



its components (ADI, ADR and ADP) and profitability (ROA). Finally, panel data analysis was used within the framework of the random effects technique for the presentation and analysis of findings. Panel data methodology has the advantage of not only allowing researchers to undertake cross-sectional observations over several time periods, but also control for individual heterogeneity due to hidden factors, which, if neglected in time-series or cross-section estimations leads to biased results (Baltagi, 1995). Bartov et al. (2000) maintain that if confounding variables are not controlled, it could lead to biased results, such as not accepting the null hypothesis when it should actually be accepted.

### **3.3.1 Panel data specifications**

In this piece of work the panel data, analysis is deemed appropriate since the study is interested in examining the causal relationship between different components of WCM measured with CCC (ADI, ADR and ADP) and profitability (ROA) for five different PRFs within six consecutive years, from 2008 to 2013. In view of the need to control some individual heterogeneity in assessing the effect of WCM on profitability, prior research suggests that variables like the inventory divided by current assets (ADI/CA), current assets divided by total assets (CA/TA), current assets divided by the entire assets (CA\_TURN), leverage (LEV) as well as the size of the firm measured by the record of the entire assets (TALOG) that may impact the profitability of a firm (Padachi, 2006; Stephen and Elvis, 2011; Tauringana and AdjapongAfrifa, 2013). Therefore, these variables were controlled in the analysis.

In this study, the stable panel data has been preferred to the unstable panel data. It is due to the fact that the panel data permits equivalent observation for each component of observations made (Tauringana and AdjapongAfrifa, 2013). In panel data analysis, one significant choice to make is either to use a random effects model or a fixed effects model or undertake a single shared intercept tenure, this follows that the intercept for separate firms vary from the shared intercept random, given that the fixed effects model takes on varying intercept for single firms. The random effects panel data regression analysis was preferred following similar research work undertaken by previous authors (Karaduman et al., 2010, 2011; Tauringana, and AdjapongAfrifa, 2013). In this study, the specific data analysis technique used is the *multilevel mixed-effects linear regression model* available in STATA 12.0.

### **3.3.2 Description of method for interpretation of the results**

The sign and p-values of each regression weights are used to determine the direction and significance of the effect (regression weight estimated) respectively, for each of the proposed relationship between WC components and profitability. This is to analyse the effect of each WC components (ADI, ADR, ADP, CCC) on profitability of the sampled PRFs to address research objectives and questions one to three.

Moreover, the effect on the company was also tested as a dummy variable. E-LTD was used as the base company, so four dummies were created, being D\_JLTD, D\_MLTD, D\_LLTD, and D\_SLTD. Previous research such as Shah and Sana (2005) found that

firm effect can affect WCM in oil and gas industry. This analysis of firm effect was to establish whether differences exist in the hypothesized relationships about WCM components and profitability for the five sampled PRFs during 2008 to 2013.

### 3.4 Regression model specification

The regression analysis models developed for this study are intended to investigate how the various components of WCM relate profitability. The definition for each term used in the equations are presented in Table 2.

$$ROA_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 QR_{it} + \beta_3 ADI/CA_{it} + \beta_4 CA/TA_{it} + \beta_5 CA\_TURN_{it} + \beta_6 LEV_{it} + \beta_7 TALOG_{it}$$

$$ROA_{it} = \beta_0 + \beta_1 ADI_{it} + \beta_2 QR_{it} + \beta_3 ADI/CA_{it} + \beta_4 CA/TA_{it} + \beta_5 CA\_TURN_{it} + \beta_6 LEV_{it} + \beta_7 TALOG_{it}$$

$$ROA_{it} = \beta_0 + \beta_1 ADR_{it} + \beta_2 QR_{it} + \beta_3 ADI/CA_{it} + \beta_4 CA/TA_{it} + \beta_5 CA\_TURN_{it} + \beta_6 LEV_{it} + \beta_7 TALOG_{it}$$

$$ROA_{it} = \beta_0 + \beta_1 ADP_{it} + \beta_2 QR_{it} + \beta_3 ADI/CA_{it} + \beta_4 CA/TA_{it} + \beta_5 CA\_TURN_{it} + \beta_6 LEV_{it} + \beta_7 TALOG_{it}$$

$$ROA_{it} = \beta_0 + \beta_1 ADP_{it} + \beta_2 QR_{it} + \beta_3 ADI/CA_{it} + \beta_4 CA/TA_{it} + \beta_5 CA\_TURN_{it} + \beta_6 LEV_{it} + \beta_7 TALOG_{it}$$

### 3.5 Use of qualitative method

Interview guide will be developed to interview managers of PRFs in the Kumasi Metro. The purpose is to examine the challenges the managers face with WCM in their respective firms. The sample interview guide is provided in Appendix 1. It covers the challenges the managers might be facing in terms of the profitability (ROA) and four

areas of WCM, namely: accounts payable, accounts receivables, cash conversion cycle, and inventory holding as well as any other challenges that might be mentioned.

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## **CHAPTER FOUR**

### **ANALYSIS OF EMPIRICAL RESULTS**

#### **4.1 Introduction**

This chapter presents the relevant data of the results obtained from the field work to address the objectives of the study. It also presents analysis and discussion of the results and findings in the light of existing literature on WCM. It starts with descriptive statistics of net working capital (NWC), the dependent and independent variables as well as the control variables for the study. It continues with the panel data regression analysis and ends with a qualitative analysis of results from interview with managers of the selected PRFs.

#### **4.2 Networking Working Capital (NWC) investment**

In order to effectively examine WCM of petroleum retail firms (PRFs) in the Kumasi Metropolis, it is useful to provide a descriptive analysis of the firms' NWC investment and NWC to total assets. While analysis of NWC investment will tell whether NWC of each firm is positive or negative, the NWC to total assets will help stakeholders analyze the extent of assets tied up in working capital, or the amount of assets required to run the day to day operations of a company (Khan and Jain, 2007).

While an increasing NWC as a ratio of total assets is expected to be positive, indicating that the company is improving in its liquidity for the period time, a decreasing NWC as

a ratio of total assets is expected to be negative, indicating that the company may have too many total current liabilities, reducing the amount of NWC available. Results of NWC and NWC to total assets are presented in Table 3 for the group and each firms.

Table 3 Descriptive analysis of NWC investment for each firm and group

	Descriptive	CA	CL	NWC	NWC/
		GHS	GHS	GHS	TA
E-LTD	Mean	507482.83	476409.91	31072.92	0.11
	SD	258905.82	289309.55	48668.06	0.05
	Median	465250.00	403630.00	54646.00	0.10
J-LTD	Mean	475795.00	538250.17	-62455.17	0.12
	SD	297903.01	642740.07	473447.25	0.18
	Median	442360.00	291550.00	51390.00	0.09
L-LTD	Mean	363271.11	302816.59	60454.51	0.17
	SD	205384.99	188405.83	31765.70	0.13
	Median	442360.00	291550.00	51390.00	0.09
M-LTD	Mean	606914.22	536981.33	69932.89	0.20
	SD	348564.23	345968.56	20206.33	0.07
	Median	571470.00	495250.00	69104.00	0.20
S-LTD	Mean	563372.71	451883.34	111489.36	0.11
	SD	370484.94	316598.15	66279.16	0.28
	Median	463210.00	367190.00	83449.00	0.19
GROUP(5)	Mean	503370.00	461270.00	42099.00	0.14
	SD	293137.00	370633.00	208735.00	0.16
	Median	434554.78	347895.10	62099.30	0.15
ANOVA TEST	F-test value	0.57	0.37	0.548	0.408
	Sign.	0.687	0.828	0.702	0.801
REMARKS		no differences	no differences	no differences	no differences

Note: significance level = 0.05

Table 3 shows the means, standard deviations (SD), median of current assets (CA), current liabilities (CL), NWC and NWC to total assets (NWC/TA). It also shows the results of ANOVA test of differences in the means of NWC and its components.

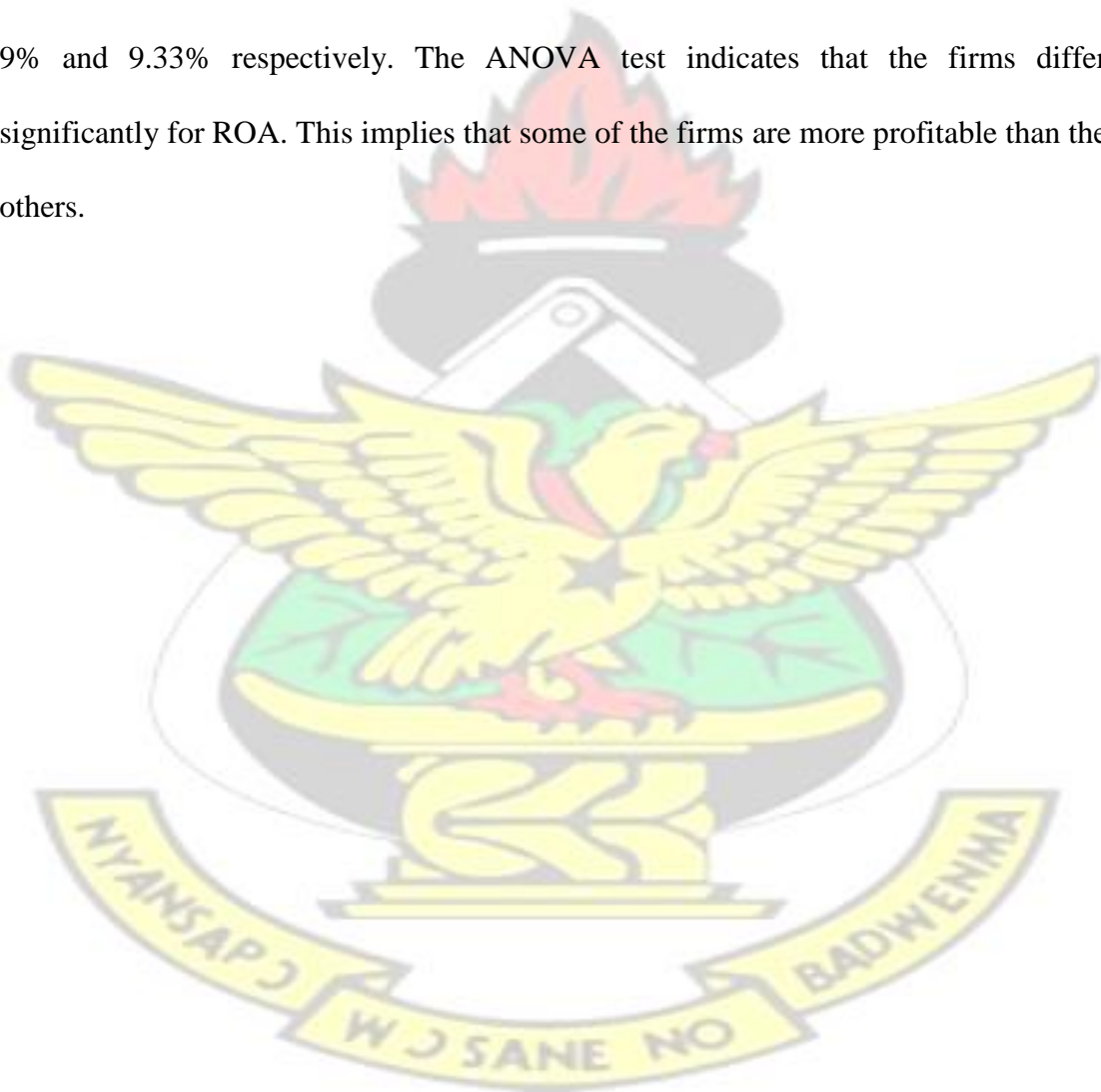
From Table 3, all the firms recorded a positive mean NWC except J-LTD that had a negative NWC of GHS -62, 455.17 for the past six years (2009 to 2013). Among the four firms that recorded positive mean NWC, S-LTD made the highest gains in NWC amounting to GHS 111,489.36, followed by M-LTD amounting to GHS 69,932.89, LLTD had NWC of GHS 60,454.51, and E-LTD recorded the least gains in NWC of GHS 31072.92. For the group analysis, all five firms made a positive mean NWC of GHS 42, 099.00 for the six year period. The differences in NWC gains among the firms were not significant, all p-values are greater than 0.05 ( $p > 0.05$ ). This implies that, statistically, the five PRFs have similar NWC investment standing or level.

Furthermore, the NWC to total assets (NWC/TA) ratio for each of the firms indicates small values ranging from 11% (0.11) to 20% (0.20), with a relatively small ratio of 0.14:1 for the group. No significant differences exist between these NWC to total assets ratios, according to the statistical significance test using the ANOVA ( $p > 0.05$ ). This shows that, generally, the firms are experiencing an increasing NWC to total assets ratio, which indicates a positive sign, implying that each of the five companies may have enough assets to cover current liabilities. Thus, NWC to total assets analysis is indicating that the companies may not be having any serious difficulties with WCM.

### 4.3 Descriptive Analysis for Dependent and Independent Variables

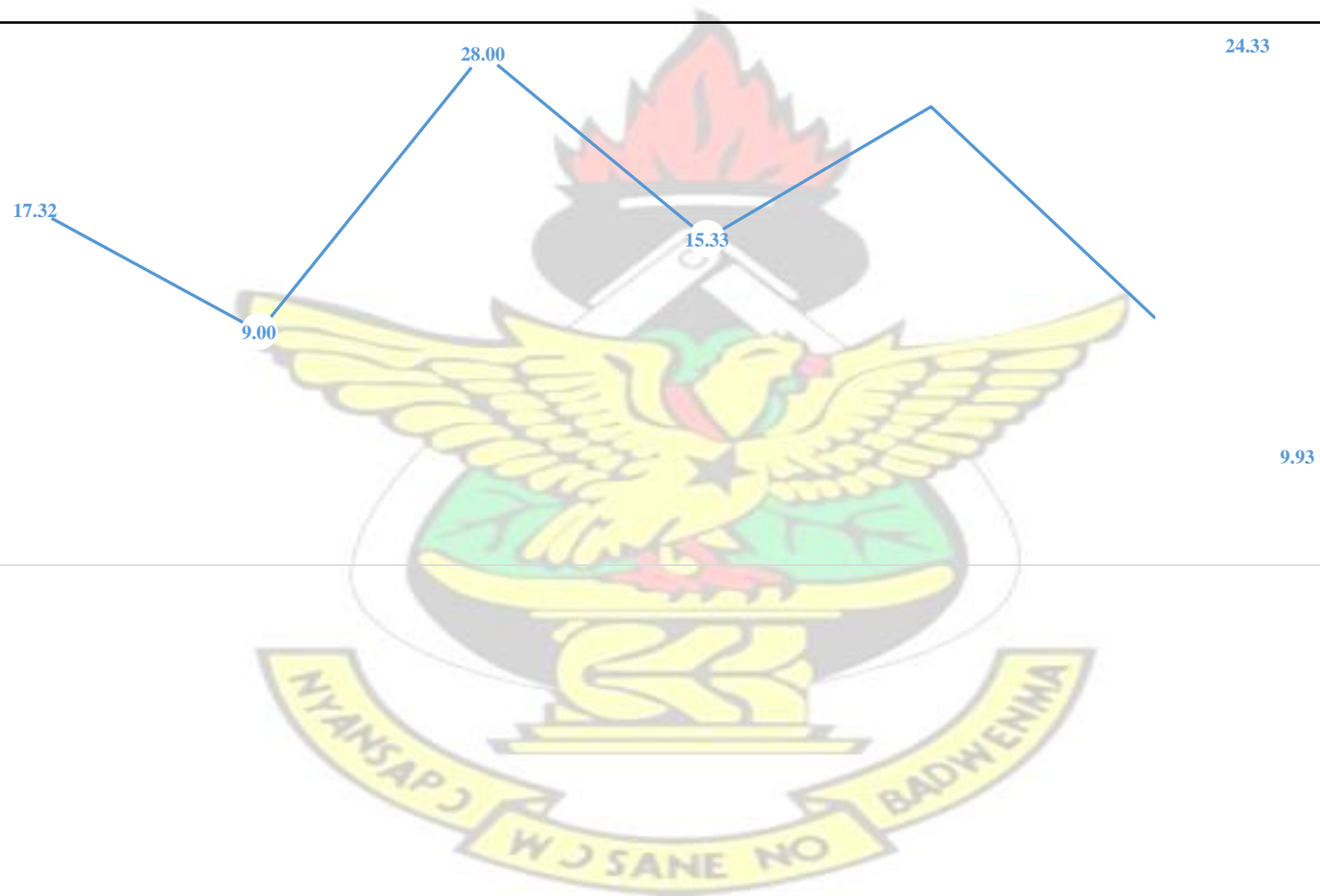
#### 4.3.1 Dependent Variable: Profitability (ROA)

The descriptive analysis for profitability, measured by return on assets (ROA), is presented in Figure 2 for each firm. It shows that the mean return on assets (ROA) is 17.32% for the five firms. Among the firms, J-LTD recorded the highest ROA 28%, followed by 24.33% for M-LTD, 15.4% for L-LTD and E-LTD and S-LTD recorded 9% and 9.33% respectively. The ANOVA test indicates that the firms differ significantly for ROA. This implies that some of the firms are more profitable than the others.





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OVERALL mean	E-LTD (mean = 9.0, J-LTD (mean = 28,	L-LTD (mean =	M-LTD	S-LTD
(mean = 17.32, SD = 9.49, Median = 13.02, Median = 17.50),	SD = 5.90, Median = 7.00)	SD = 19.88, Median = 27.00)	(mean = 24.33, SD = 6.89, Median = 26.50)	(mean = 9.93, SD = 8.17, Median = 10.50)
F = 3.44, Sign. 0.02				

Figure 2 Descriptive analysis of ROA for all firms



#### **4.3.2 Independent Variables: Components of Working Capital (ADI, ADR, ADP, CCC)**

According to Tables 4, the average number of days of inventories (ADI) for the five firms is 7.83 days, with L-LTD and S-LTD recording about 9 days as the highest number of days of inventories, while E-LTD, J-LTD and M-LTD recorded about 7 days of inventories, which is relatively low. The median ADI is around 8 days. These figures are lower than those reported in some previous studies (Charitou, Elfani, and Lois, 2010; Deloof, 2003; Shah and Sana, 2005; Tauringana and AdjapongAfrifa, 2013).

In particular, the mean and median ADIs are far lower than the ADI mean of 21 days and median of 24 days found in Shah and Sana (2005) for seven listed firms in Pakistan's Oil and Gas industry. This implies that comparatively the sampled PRFs in Ghana appear to use about fewer than ten days to clear inventories, and are therefore more efficient in managing inventories better than their counterpart firms in Pakistan's Oil and Gas industry, who take approximately three weeks to clear inventories. One explanation for the sharp contrast is that those Pakistan companies were manufacturing companies while those used in this study are retailers. It has been established that retailers have shorter ADI than manufacturers that produce and sell mostly on credit (Uyar, 2009).

Table 4 Descriptive analysis for components of NWC for five sampled PRFs

ALL COMPANIES (five firms for six years)			
Variable	Mean	Std. deviation	Median
ROA	17.32	13.02	17.50
ADI	7.83	2.57	8.00
ADR	33.93	9.66	36.00
ADP	11.70	4.63	12.50
CCC	29.37	10.20	32.00
QR	0.82	0.85	0.68
ADI/CA	0.37	0.13	0.36
CA/TA	0.89	0.15	0.94
CA_TURN	0.07	0.02	0.06
LEV	0.75	0.16	0.80
TA	GHS591430.00	GHS 439892.00	GHS 467843.91
TALOG	5.68	0.27	5.67

The average number of days accounts receivables (ADR) for the five sampled PRFs is approximately 34 days with a median of 36 days and standard deviation of about 10 days among the observations. For these results, while the median ADR is similar to those of Shah and Sana (2005) for seven listed firms in Pakistan's Oil and Gas industry, the mean of 34 days ADR for the sampled PRFs in Ghana appears to be better than the mean ADR of 51.99 days (about one month and three weeks) for firms in Pakistan's Oil and Gas industry. This implies that the selected Ghanaian PRFs are more efficient in debt collection by taking relatively less number of days to collect their debts from customers than their counterparts in Pakistan Oil and Gas industry.



Table 5 Descriptive analysis of WC components and profitability for each firm

Variable	E-LTD			J-LTD			L-LTD			M-LTD			S-LTD			ANOVA TEST	
	Mean	SD	MD	Mean	SD	MD	Mean	SD	MD	Mean	SD	MD	Mean	SD	MD	F	Sign.
ROA	9.00	9.49	7.00	28.00	5.90	27.00	15.33	19.88	27.00	24.33	6.89	26.50	9.93	8.17	10.50	3.44	0.02
ADI	7.50	1.38	7.50	7.17	1.72	7.00	9.00	4.29	7.00	7.00	2.97	7.50	8.50	1.64	8.00	0.659	0.626
ADR	38.50	5.13	40.00	30.00	15.01	34.50	29.67	14.40	34.50	36.67	1.03	37.00	34.83	2.48	35.50	1.01	0.421
ADP	12.50	4.42	13.00	7.67	4.32	8.50	10.50	6.02	8.50	14.83	2.79	15.50	13.00	2.45	13.00	2.538	0.065
CCC	28.33	14.72	33.00	30.83	13.26	36.50	28.33	13.63	36.50	28.83	1.83	28.00	30.50	3.83	31.50	0.074	0.99
QR	0.76	0.14	0.76	0.64	0.38	0.57	1.33	1.86	0.57	0.67	0.28	0.56	0.72	0.24	0.64	0.665	0.622
ADI/CA	0.30	0.04	0.29	0.39	0.14	0.36	0.36	0.19	0.36	0.37	0.14	0.39	0.41	0.13	0.39	0.632	0.644
CA/TA	0.85	0.05	0.86	0.83	0.23	0.91	0.82	0.19	0.91	0.98	0.02	0.99	0.97	0.02	0.98	1.968	0.13
CA_TURN	0.07	0.01	0.07	0.07	0.05	0.06	0.08	0.01	0.06	0.05	0.01	0.05	0.06	0.01	0.06	1.199	0.336
LEV	0.77	0.10	0.78	0.73	0.17	0.77	0.65	0.28	0.77	0.83	0.06	0.85	0.77	0.06	0.80	1.054	0.4
TALOG	5.73	0.21	5.71	5.69	0.43	5.68	5.57	0.22	5.68	5.72	0.30	5.75	5.70	0.24	5.67	0.287	0.884

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From Table 5, among the five PRFs, E-LTD recorded the highest average number of days accounts receivables of about 39 days, followed by M-LTD, about 37 days, then S-LTD with 35 days, while L-LTD and J-LTD recorded a relatively lower number of days, approximately 30 days respectively.

The average number of days of accounts payables used by the five sampled firms is approximately 12 days with a median of approximately 13 days and a standard deviation of about 5 days. In a similar study by Shah and Sana (2005) for seven listed firms in Pakistan's Oil and Gas Industry from 2001 to 2005, they found an ADI of 72.98 days with median of 69 days. Comparatively, mean ADI for the sampled PRFs in Ghana is far less than the performance of their counterparts in Pakistan (Shah and Sana, 2005). This implies that the selected Ghanaian PRFs take less number of days to pay their creditors than their counterparts in Pakistan Oil and Gas industry.

Among the five firms, the highest mean ADP is 15 days for M-LTD, 13 days for SLTD and E-LTD, 11 days for L-LTD and the least mean ADP is 8 days recorded by JLTD. The average cash conversion cycle (CCC) for the five sampled PRFs is 29.37 days with a median of 32 days and 10.20 days of standard deviation. Three of the five PRFs, E-LTD, L-LTD and M-LTD, recorded average CCC of about 28 days and two of the firms, J-LTD and S-LTD recorded an average of 31 days CCC. These findings contrast those found in Shah and Sana (2005) for seven listed firms in Pakistan's Oil and Gas industry.

In Shah and Sana (2005), the degree of variability (standard deviation) of CCC among the firms was 43 days with a maximum CCC of 139 days, but with mean CCC of -6.6. In this study Ghanaian PRFs have a standard deviation of 10 days for CCC and mean of 29 days and median of 32 days. This implies that the selected Ghanaian PRFs are more efficient in cash conversion management by taking relatively less number of days for cash conversion cycle than their counterparts in Pakistan Oil and Gas industry. It is believed that the negative cash conversion cycle for Pakistan oil and gas firms is due to pending payments of bills on time (Shah and Sana, 2005, p. 306). One major reason that accounts for the sharp contrast between the sampled petroleum firms in Ghana and those in Shah and Sana (2005) is that those Pakistan companies were manufacturing companies while those used in this study are retailers. It has been established that retailers have shorter CCC than manufacturers that produce and sell mostly on credit basis (Uyar, 2009).

#### **4.3.3 Controlled Variable: QR, ADI/CA, CA/TA, CA\_TURN, LEV, TALOG**

According to Table 5, for the controlled variables, the results show that the mean quick ratio (QR) for the five sample PRFs is 0.82 with a median ratio of 0.68. These values are below at 1:1 ideal ratio for QR. Since QR is an acid test ratio that is a more severe and stringent test of a firm's ability to pay its short-term obligations as and when they become due, the relatively low QR results imply that averagely the firms might be finding difficulties with their management of working capital (Arnold, 2008). Among the firms, apart from L-LTD that has mean QR of 1.33:1, the rest have mean QR less than one, implying NWC management might be a problem with the



firms.

Moreover, the results in Table 4 show that averagely the stock constitutes 3.7% of the current assets (ADI/CA). The average current assets to total assets ratio is 0.89:1 (0.55:1) with a median value of 0.94:1. The current asset turnover (CA\_TURN) is .07 times. The average leverage (LEV) is 0.75 time, with a median of 80, whilst on average total assets of the sampled PRFs are worth GHS 591430.00 with a median value of the total of GHS 46783.91, which indicate that the chosen firms are relatively small in terms of size.

#### **4.3.4 Differences in Profitability and WC Components among Firms**

According to the ANOVA test results in Tables 4 and 5, with the exception of ROA, there were no statistically significant differences among the averages of WCM variables as well as the controlled variables for the five sampled PRFs. Therefore, all the five firms could be considered to be one population. This is a strong reason to treat the observations (data collected) for the five PRFs as one set of data for the regression analysis, though the influence of each firm as a dummy variable will be included in the regression models.

#### **4.4 Correlation Analysis for Dependent, Independent and Controlled Variables**

The results of Pearson correlation coefficients for dependent, independent and controlled variables are presented in Table 6. This analysis uses the combined data of

all the five selected PRFs. The purpose is to assess the association between the CCC and its components (ADI, ADR and ADP) and profitability.

The correlation results Table 6 indicate a negative, but non-significant correlation between profitability and ADI, ADR and ADP. Among the independent variables, there are high and significant correlations between CCC and two measures of WCM, being QR, ADR, but not ADI and ADP. These are consistent with the findings of Tauringana and AdjapongAfrifa (2013). It is worth noting that all the four components of WCM have a negative and significant relationship with QR.

For the rest of the independent variables, the correlations indicate that ADI positively correlates with ADP, negatively correlates with ADI/CA and LEV. While ADR positively correlates with LEV and total assets. ADP positively and significantly correlates with ADI/CA, CA/FA, LEV and total assets.

From the results in Table 6, the correlations also suggests that multicollinearity may not be a problem in linear regression analysis since the variable coefficients are relatively low. Hair et al. (2010) suggested that multicollinearity might be a problem where the inter-construct correlations exceeds 0.80 or 0.90. The results in Table 6 show that all of the correlations between independent variables are less than the recommended values. In addition to the correlations, according to Cooper and Schindler (2006), some level of multicollinearity might exist even where all the correlation coefficients are very low.

Table 6. Correlation Analysis for Dependent, Independent and Controlled Variables

	ADI	ADR	ADP	CCC	ROA	QR	ADI/CA	CA/TA	CA_TURN	LEV	TALOG	VIF
ADI	1											6.278
ADR	0.281	1										5.769
ADP	0.607***	0.328	1									2.793
CCC	0.247	0.771***	0.003	1								4.524
ROA	-0.206	-0.048	-0.280	0.045	1							7.415
QR	-0.572**	-0.527**	-0.525**	-0.396*	0.026	1						N/A
ADI/CA	0.779***	-0.001	0.436**	0.060	-0.027	-0.608***	1					2.151
CA/TA	0.317	0.246	0.364**	0.222	0.211	-0.363*	0.368*	1				5.798
CA_TURN	0.121	0.201	0.032	0.163	-0.251	-0.019	-0.241	-0.721***	1			5.276
LEV	0.427*	0.368*	0.538***	0.183	0.155	0.819***	0.446***	0.474***	-0.098	1		4.659
TALOG	0.176	0.475**	0.356*	0.226	0.202	-0.324	-0.067	-0.083	0.499**	0.353*	1	2.353

Notes: Significance levels \*\*\*p<0.001, \*\*p<0.001, \*p<0.05

Therefore, the variance inflation factors (VIFs) for the independent variables were also examined. A VIF of less than 10 suggests that multicollinearity may not be a problem to the multiple regression models for this study (Field, 2005).

#### 4.5 Regression Analysis

The following section discusses the results of panel data analysis using mixed effects linear regression method. Since there are four measures of WCM, each of them will be used to create a separate model (CCC, ADI, ADR and ADP) with their respective controlled variables. The procedure for interpreting the tables are given below.

The model goodness of fit statistics used is the Log likelihood which functions like the F-value in linear regression analysis, and the significance of the Log is tested using the p-value captured by „Prob> chi2“. A value less than 0.05 means the model is significantly good. The Wald Chi2 is similar to the R-square, which is a measure of the co-efficient of determination. That is the variations in the dependent variable explained by the collect effect of the independent variables. All p-values are set to 0.05 significance level or 95% confidence level and all test are two-tailed.

The regression co-efficients of the independent variables are examined to determine the relative influence of each of them on the dependent variable, ROA. The corresponding Z-score and significance values of the independent variables are used to determine whether the regression co-efficient is significant or not. Usually a zscore of 1.96 or 2



should be significant or have a p-value less than 0.05 ( $p < 0.05$ ). Results of regression analysis for testing each of the four hypotheses are presented in Tables 7 to 10 respectively. Each of the hypothesis is discussed in turn under each sub-heading.

#### 4.5.1 Effect of CCC on profitability (ROA) The

first hypothesis states that:

*H1: There is a significant relationship between cash conversion cycle and profitability.*

The regression model for Hypothesis H1 is:

$$ROA_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 QR_{it} + \beta_3 ADI/CA_{it} + \beta_4 CA/TA_{it} + \beta_5 CA\_TURN_{it} + \beta_6 LEV_{it} + \beta_7 TALOG_{it}$$

The results for testing hypothesis H1 are presented in Table 7.

Table 7 shows results on the relationship between CCC and profitability (ROA). It indicates that the model as a whole is significant with a Log likelihood of -102.160 and Prob> chi2 (0.0000). This means that all the independent variables collectively explains the dependent variable (ROA) significantly, and not by chance. The extent of this collect impact is 62.54% as indicated by the Wald chi2(11) statistic, which could be described as good. Thus, the model as a whole explains 62.5% of the variation in profitability.

Next, from Table 7, the panel data Multilevel Mixed-effects linear regression results indicate the relationship between CCC and ROA is positive, but not significant.

Therefore, hypothesis one (H1) is not supported. This is similar to findings of Tauringana and AdjapongAfrifa (2013) who found an insignificant association between CCC and profitability among SMEs in the UK. This finding on profitability and CCC is also consistent with the positive and non-significant relationship between CCC and profitability in Pakistan's Oil and Gas industry (Shah and Sana (2005).

**Table 7 Results of Effect of CCC on ROA**

<b>Model goodness of fit summary</b>				
Estimation method	Panel data Mixed-effects ML regression			
No. of observation	30			
Wald chi2(11)	=62.54			
Log likelihood	= -102.160			
Prob> chi2	= 0.0000			
Dependent variable	ROA			
<b>Independent Variables</b>	<b>Coeffients</b>	<b>Z-score</b>	<b>Sign.</b>	<b>Remarks</b>
_Constant	-148.424	-3.720	0.000	
CCC	0.193	1.060	0.290	Not Significant
QR	10.079	2.450	0.014*	Significant
ADI/CA	-4.310	-0.260	0.794	Not significant
CA/TA	2.039	0.090	0.926	Not significant
CA_TURN	-270.103	-2.040	0.041*	Significant
LEV	44.093	2.380	0.017**	Significant
TALOG	22.693	3.150	0.002**	Significant
D_JLTD	22.155	4.860	0.000***	Significant
D_LLTD	10.282	2.100	0.036*	Significant
D_MLTD	7.105	1.520	0.129	Not Significant
D_SLTD	-1.420	-0.300	0.764	Not significant

Notes: Significance levels \*\*\*p<0001, \*\*p<0.001, p<0.05

However, for the findings regarding CCC and profitability relationship, which indicates an insignificant relationship with profitability is inconsistent with some previous findings (Deloof, 2003; Stephen and Elvis, 2011). Moreover, while this study found a positive association between CCC and profitability, it contradicts some previous studies found a negative relationship between WCM and CCC (Akoto et al., 2013; Lazaridis and Tryfonidis, 2006; Falope and Ajilore, 2009; Hayajneh and Yassine, 2011; Karaduman et al., 2011).

These findings confirm that the influence of CCC on profitability vary from one industry and firm context to the other. Even within the same industry, there could be significant differences in the influence of CCC on profitability (Shah and Sana, 2005; Vishnani and Shah, 2007). The results also show that among the control variables, QR, CA\_TURN and LEV are significantly associated with profitability at least at five per cent level, confirming previous research in other industries (Adjei and Yeboah, 2011; Uyar, 2009).

Despite the general non-significant CCC-ROA relationship, the firm effect or differences is significant variable. As can be seen, using firm E-LTD as the base, the co-efficient for dummy variables for firms for J-LTD (D\_JLTD) is significant ( $\beta = 22.69$ ,  $z = 3.15$ ,  $p = 0.000$ ). This implies that the strength of the effect of CCC on profitability is about 23 times stronger than in J-LTD more than it is in E-LTD. Similarly, the strength of the effect of CCC on profitability is about 10.28 times stronger

than in L-LTD more than it is in E-LTD. These results suggests the relationship between CCC and profitability might be significant in some firms and non-significant in others.

This implies that the firms might have different working capital needs, and pursuing different WCM strategies and focus. This finding is supported those of previous studies (Falope and Ajilore, 2009; Shah and Sana 2005Vishnani and Shah, 2007) that found firm effect to be important and variations in WC-profitability relationship among various firm in different industries.

#### 4.5.2 Effect of ADI on Profitability (ROA) The

second hypothesis states that:

*H2: There is a significant relationship between inventory holding period (ADI) and profitability.*

The regression model for Hypothesis H2 is:

$$ROA_{it} = \beta_0 + \beta_1 ADI_{it} + \beta_2 QR_{it} + \beta_3 ADI/CA_{it} + \beta_4 CA/TA_{it} + \beta_5 CA\_TURN_{it} + \beta_6 LEV_{it} + \beta_7 TALOG_{it}$$

The results for testing hypothesis H2 are presented in Table 8. Table 8 depicts results on the effect of ADI on profitability (ROA). It indicates that the model as a whole is significant with a Log likelihood of -101.513 and Prob> chi2 (0.0000). This means that all the independent variables collectively explains the dependent variable (ROA)



significantly, and not by chance. The extent of this collect impact is 66.62% as indicated by the Wald chi2(11) statistic, which could be described as good. Thus, model as a whole explains 66.62% of the variation in profitability.

Table 8 Results of Effect of ADI on ROA

<b>Model goodness of fit summary</b>				
Estimation method	Panel data Mixed-effects ML regression			
No. of observation	30			
Wald chi2(11)	=66.62			
Log likelihood	= -101.513			
Prob> chi2	= 0.0000			
Dependent variable	ROA			
<b>Independent Variables</b>	<b>Coefficients</b>	<b>Z-score</b>	<b>Sign.</b>	<b>Remarks</b>
_Constant	-189.209	-3.900	0.000	
ADI	-3.479	-1.580	0.115	Not Significant
QR	8.536	2.390	0.017**	Significant
ADI/CA	47.878	1.210	0.227	Not significant
CA/TA	53.084	1.670	0.094	Not significant
CA_TURN	30.933	0.150	0.877	Significant
LEV	31.491	1.880	0.061	Significant
TALOG	23.039	3.270	0.001**	Significant
D_JLTD	17.576	3.150	0.002**	Significant
D_LLTD	12.516	2.580	0.010*	Significant
D_MLTD	2.867	0.520	0.602	Not Significant
D_SLTD	-6.000	-1.080	0.279	Not significant

Notes: Significance levels \*\*\*p<0001, \*\*p<0.001, p<0.05

Next, from Table 8, the panel data Multilevel Mixed-effects linear regression results indicate that the relationship between ADI and ROA is negative, but not significant. Therefore, hypothesis two (H2) is not supported. This is similar to findings of Tauring and AdjapongAfrifa (2013) among SMEs in the UK and those of Shah and Sana (2005) who found a negative and non-significant relationship between ADI and profitability in Pakistan's Oil and Gas industry. The results also suggest that there is a significant relationship between some control variables such as QR and TALOG and ROA at least at five per cent level.

Despite this the general non-significant relationship between ADI and ROA, the firm effect or differences is significant variable. As can be seen, using firm E-LTD as the base, the co-efficient for dummy variables for firms for J-LTD (D\_JLTD) is significant ( $\beta = 17.58$ ,  $z = 3.15$ ,  $p = 0.002$ ). This implies that the strength of the effect of ADI on profitability is about 17.58 times stronger than in J-LTD more than it is in E-LTD. Similarly, the strength of the effect of ADI on profitability is about 12.52 times stronger than in L-LTD more than it is in E-LTD. The results of CCC and ADI models are similar for these two firms (J-LTD and L-LTD), and suggest the relationship between ADI and profitability might be significant in some firms and non-significant in others. This implies that the firms might have different working capital needs, and pursuing different WCM strategies and focus.

#### **4.5.3 Effect of ADR on Profitability (ROA) The**

third hypothesis states that:

*H3: There is a significant relationship between accounts receivable period (ADR) and profitability.*

The regression model for Hypothesis H3 is:

$$ROA_{it} = \beta_0 + \beta_1 ADR_{it} + \beta_2 QR_{it} + \beta_3 ADI/CA_{it} + \beta_4 CA/TA_{it} + \beta_5 CA\_TURN_{it} + \beta_6 LEV_{it} + \beta_7 TALOG_{it}$$

The results for testing hypothesis H3 are presented in Table 9. Table 9 depicts results on the effect of ADR on profitability (ROA). It indicates that the model as a whole is significant with a Log likelihood of -101.701 and Prob> chi2 (0.0000). This means that all the independent variables collectively explains the dependent variable (ROA) significantly, and not by chance. The extent of this collect impact is 65.41% as indicated by the Wald chi2(11) statistic, which could be described as good. Thus, the model as a whole explains 65.41% of the variation in profitability.

From Table 9, the panel data Multilevel Mixed-effects linear regression results show that ADR is positively associated with ROA but the relationship is not significant. Therefore, hypothesis three (H3) is not supported. This is consistent with those of Shah and Sana (2005) who found a non-significant, but positive relationship between ADR and profitability in Pakistan's Oil and Gas industry.

However, the findings in respect of ADR and profitability relationship, which suggest an insignificant association with profitability, are contrary to most of the previous findings Akoto et al., 2013; Deloof, 2003; Sharma and Kumar, 2011; Tauringana and

Afrifa, 2013; Stephen and Elvis, 2011). The findings also show that some of the control variables, QR, CA\_TURN, LEV and TALOG are significantly related to profitability at least at five per cent level.

Table 9 Results of Effect of ADR on ROA

**Model goodness of fit summary**

Estimation method	Panel data Mixed-effects ML regression
No. of observation	30
Wald chi2(11)	=65.41
Log likelihood	= -101.701
Prob> chi2	= 0.0000
Dependent variable	ROA

Independent Variables	Coefficients	Z-score	Sign.	Remarks
_Constant	-145.903	-3.740	0.000	
ADR	0.357	1.440	0.149	Not Significant
QR	12.129	2.650	0.008**	Significant
ADI/CA	0.045	0.000	0.998	Not significant
CA/TA	-0.136	-0.010	0.995	Not significant
CA_TURN	-277.094	-2.160	0.031*	Significant
LEV	49.783	2.600	0.009**	Significant
TALOG	19.971	2.770	0.006**	Significant
D_JLTD	25.519	5.370	0.000***	Significant
D_LLTD	12.178	2.510	0.012*	Significant



D_MLTD	7.414	1.620	0.105	Not Significant
D_SLTD	-0.046	-0.010	0.992	Not significant

Notes: Significance levels \*\*\*p<0001, \*\*p<0.001, p<0.05

Despite this the general non-significant relationship between ADR and ROA, the firm effect or differences is significant variable. As can be seen, using firm E-LTD as the base, the co-efficient for dummy variables for firms J-LTD (D\_JLTD) is significant ( $\beta = 25.519$ ,  $z = 5.37$ ,  $p = 0.000$ ). This implies that the strength of the effect of ADR on profitability is about 25.52 times stronger than in J-LTD more than it is in E-LTD. Similarly, the strength of the effect of ADR on profitability is about 12.17 times stronger than in L-LTD more than it is in E-LTD. The results of CCC, ADI and ADR are similar for these two firms, and suggest that the relationship between ADR and profitability might be significant in some firms and non-significant in others. This implies that the firms might have different working capital needs, and pursuing different WCM strategies and focus.

#### 4.5.4 Effect of ADP on profitability (ROA) The

fourth hypothesis states that:

*H4: There is a significant relationship between accounts payable (ADP) and profitability.*

The regression model for Hypothesis H4 is:

$$ROA_{it} = \beta_0 + \beta_1 ADP_{it} + \beta_2 QR_{it} + \beta_3 ADI/CA_{it} + \beta_4 CA/TA_{it} + \beta_5 CA\_TURN_{it} + \beta_6 LEV_{it} + \beta_7 TALOG_{it}$$

The results for testing hypothesis H4 are presented in Table 10. Table 10 depicts results on the effect of ADP on profitability (ROA). It indicates that the model as a whole is significant with a Log likelihood of -100.194 and Prob > chi2 (0.0000). This means that all the independent variables collectively explain the dependent variable (ROA) significantly, and not by chance. The extent of this collective impact is 75.50% as indicated by the Wald chi2(11) statistic, which could be described as good. Thus, the model as a whole explains 75.50% of the variation in profitability.

From Table 10, the panel data Multilevel Mixed-effects linear regression results suggest that the relationship between ADP and ROA is negative and significant. Therefore, hypothesis four is supported. Thus ADP is the most significant factor in determining profitability in the sampled PRFs. This implies the less the sampled firms delay in paying creditors, the more they increase profitability in terms of ROA. A reduction of ADP by -1.197 will cause a one percent increase in profitability of the firms. This finding is similar to those of Adjei and Yeboah (2011), Falope and Ajilore (2009), Raheman and Nasr (2007), Sharma and Kumar (2011) and Tauringana and AdjapongAfrifa (2013).

Table 10 Results of ADP on ROA

**Model goodness of fit summary**

Estimation method	Panel data Mixed-effects ML regression
No. of observation	30
Wald chi2(11)	= 75.50
Log likelihood	= -100.194
Prob> chi2	= 0.0000
Dependent variable	ROA

Independent Variables	Coefficients	Z-score	Sign.	Remarks
_Constant	-166.483	-4.340	0.000***	
ADP	-1.197	-2.340	0.019*	Significant
QR	7.508	2.200	0.028*	Significant
ADI/CA	9.933	0.590	0.557	Not significant
CA/TA	26.116	1.380	0.167	Not significant
CA_TURN	-113.938	-0.920	0.360	Not significant
LEV	35.029	2.210	0.027*	Significant
TALOG	24.632	3.620	0.000***	Significant
D_JLTD	15.786	3.030	0.002**	Significant
D_LLTD	8.041	1.700	0.088	Not significant
D_MLTD	9.950	2.240	0.025*	Significant
D_SLTD	-3.070	-0.680	0.495	Not significant

Notes: Significance levels \*\*\*p<0001, \*\*p<0.001, p<0.05

However, the finding on ADP and profitability relationship contrasts those of Gill et al. (2010) and Shah and Sana (2005). In particular, Shah and Sana (2005) found a non-

significantly positive relationship between ADP and profitability in Pakistan's Oil and Gas industry.

The results also suggest that for some of the control variables, QR, LEV and TALOG, their relationship with profitability is significant at least at five per cent level. Despite this the general non-significant relationship ADR between ROA, the firm effect or differences is significant variable. As can be seen, using firm E-LTD as the base, the co-efficient for dummy variables for firms for J-LTD (D\_JLTD) is significant ( $\beta = 15.786$ ,  $z = 5.37$ ,  $p = 0.002$ ). This implies that the strength of the effect of ADP on profitability is about 15.79 times stronger than in J-LTD more than it is in E-LTD. Similarly, the strength of the effect of ADP on profitability is about 9.95 times stronger than in M-LTD more than it is in E-LTD. The results suggest that the relationship between ADP and profitability might be significant in some firms and non-significant in others. This implies that the firms might have different working capital needs, and pursuing different WCM strategies and focus.

#### **4.7 Analysis of Interview with Managers**

The five managers of the five petroleum retail firms were interviewed to understand the challenges their PRFs face with WCM. A content analysis was conducted and the results are presented in common themes of the challenges. This was because all the challenges mentioned were similar and no different from each other.

##### **4.7.1 Challenges with cash management**

The following are the main challenges the five PRFs faced with cash management:



1. Difficulty in providing collateral security to banks for credit facilities to run business. According to the manager of E-LTD,  
*„some of the banks require several collateral securities that are not easy to get, before credit facilities will be given you’.*
2. Cash handling problems such as pilfering at the sales points is still a challenge. To handle this the managers mentioned that some of the measures they put in place to reduce cash handling problems include the use of dropping cash in safes. According to them, cash held at a point in time should not exceed GHS 500. Any cash received at sale point amounting to GHS 500 should be immediately deposited into the safe provided. According to the Manager of L-LTD,  
*„this is still not the most reliable solution. It is about getting workers you can trust, who will be faithful to drop all monies received.’*

Also movement of cash to the bank also tend to be a challenge due to attacks from armed robbers and the likelihood of money getting missing. To minimize this problem, the PRFs undertake insurance policy to cover cash in transit. In addition to that, sometimes the banks also come to the PRF site to pick-up cash to the bank.

3. There are also frequent attacks from armed robbers at retail fuel sites. According to the managers, these rampant attacks pose threat to cash management. To this they mentioned that the companies undertake insurance policies that cover cash in safe, so that in case of any robbers attack the sites of these PRFs to break into safes, they can be indemnified.

#### 4.7.2 Challenges relating to Inventory (stock)

The main challenge these PRFs face, according to the managers, is pilfering of the stock of fuel while in transit. They mentioned that sometimes transporters steal some of the stock from the Oil Mining Companies (OMCs) to the PRFs site. To reduce this practice, the OMCs have developed some tracking systems that monitor stock in transit.

#### 4.7.3 Challenges relating to debtors

The following are some of the key challenges faced by the five firms.

Debtors do not keep to their agreement. There is frequent default in payments which affect WCM in the firms seriously. According to manager of J-LTD.

*It is becoming extremely difficult handling our debtors over the past six years.*

*This is a major reason accounting for the negative figure in NWC for the past six year for our firm.*

Consistent with the descriptive analysis and regression results, J-LTD recorded a mean NWC from 2008 to 2013 of GHS -62455.17, and J-LTD had a worse ADR as high as 25.519 times company E ( $\beta = 25.519$ )

Increasing fuel prices in Ghana also put more pressure on the PRFs to demand for more WC to manage their current liabilities. This, according to them, is not favouring WCM at all.

#### **4.7.4 Challenges relating to creditors**

The only challenge the PRFs have with suppliers, the OMCs, is that the process of getting contractual agreements completed appears too cumbersome with many documentations and demand for collateral security from the PRFs. This can delay agreements for new orders.



## **CHAPTER FIVE**

## **SUMMARY, CONCLUSION AND RECOMMENDATIONS**

### **5.1 Introduction**

This concluding chapter presents a summary of the study, the main findings, conclusion, theoretical implications and managerial recommendations of this study, and the recommendation for future research.

### **5.2 Summary of Findings**

In this study, the main purpose was to assess the effect of WCM on profitability of some selected PRFs in the Kumasi Metropolis. The objectives were to examine the relationships between each of the WC components, ADI, ADR, ADP and CCC on profitability. The study was basically quantitative study but employed a mixture of relevant qualitative and quantitative methods in data analysis to achieve a more objective result from both the secondary data and interview with managers. A sample of five selected petroleum retail firms in the Kumasi Metropolis were taken for this study. The data used were audited financial statements for six years from 2009 to 2013. Data was analyzed using descriptive analysis, correlation, and panel data methodology available in STATA 12.0.

In this study, panel data analysis is deemed appropriate since the study is interested in examining the causal relationship between different components of WC measured with CCC (ADI, ADR and ADP) and profitability (ROA) for five different PRFs within six consecutive years, from 2008 to 2013. The main dependent variable was profitability, measured in ROA, and the independent variables were the components of WC,



measured in CCC, ADI, ADR and ADP. Some variables that were controlled were inventory divided by current assets (ADI/CA), current assets divided by total assets (CA/TA), current assets divided by turnover (CA\_TURN), leverage (LEV) and firm size measured by log of total assets (TALOG). The specific data analysis technique used is the multilevel mixed-effects linear regression model available in STATA 12.0. Based on objective analysis of data, the following are a summary of the major findings of the study grouped according to the research question (RQ).

### **5.2.1 General Findings on WCM descriptive analysis**

All the firms recorded a positive mean NWC except J-LTD that had a negative NWC of GHS -62, 455.17 for the past six years (2009 to 2013). Among the four firms that recorded positive mean NWC, S-LTD made the highest gains in NWC.

Furthermore, the NWC to total assets (NWC/TA) ratio for each of the firms indicates small values ranging from 11% (0.11) to 20% (0.20), with a relatively small ratio of 0.14:1 for the group.

The differences in NWC gains and NWC/TA among the firms were not significant, all p-values are greater than 0.05 ( $p > 0.05$ ). This implies that, statistically, the five PRFs have similar NWC investment standing or level.

Thus, NWC to total assets analysis is indicating that the companies may not be having any serious difficulties with WCM.

Among the firms, J-LTD recorded the highest ROA 28%, followed by 24.33% for M-LTD, 15.4% for L-LTD and E-LTD and S-LTD recorded 9% and 9.33%

respectively. The ANOVA test indicates that the firms differ significantly for ROA. This implies that some of the firms are more profitable than the others.

In particular, the mean and median ADIs are far lower than the ADI mean of 21 days and median of 24 days found in Shah and Sana (2005) for seven listed firms in Pakistan's Oil and Gas industry. This implies that comparatively the sampled PRFs in Ghana appear to use about fewer than ten days to clear inventories, and are therefore more efficient in managing inventories better than their counterpart firms in Pakistan's Oil and Gas industry, who take approximately three weeks to clear inventories.

This implies that the selected Ghanaian PRFs are more efficient in debt collection by taking relatively less number of days to collect their debts from customers than their counterparts in Pakistan Oil and Gas industry.

This implies that the selected Ghanaian PRFs take less number of days to pay their creditors than their counterparts in Pakistan Oil and Gas industry.

This implies that the selected Ghanaian PRFs are more efficient in cash conversion management by taking relatively less number of days for cash conversion cycle than their counterparts in Pakistan Oil and Gas industry. It is believed that the negative cash conversion cycle for Pakistan oil and gas firms is due to pending payments of bills on time (Shah and Sana, 2005, p. 306).

### **5.2.2 Relationship between CCC and profitability**

The study found that the relationship between CCC and ROA is positive, but not significant. Therefore, hypothesis one (H1) was not supported confirming similar

to findings in previous research (Tauringana and Afrifa, 2013; Shah and Sana, 2005).

However, the finding in respect of CCC and profitability relationship, which indicate a non-significant association with profitability, which appear to be inconsistent with some past studies (Deloof, 2003; Stephen and Elvis, 2011).

Moreover, while this study found a positive association between CCC and profitability, it contradicts some previous studies found a negative relationship between WCM and CCC (Akoto et al., 2013; Lazaridis and Tryfonidis, 2006; Falope and Ajilore, 2009; Hayajneha nd Yassine, 2011; Karaduman et al., 2011).

### **5.2.3 Relationship between ADI and profitability**

This study found that the relationship between ADI and ROA is negative but not significant. Therefore, hypothesis two (H2) was not supported. This finding is similar to findings of previous studies (Tauring and Afrifa, 2013; Shah and Sana, 2005)

### **5.2.4 Relationship between ADR and profitability**

The findings show that the relationship between ADR and ROA is positive, but not significant. Therefore, hypothesis three (H3) was not supported. This is consistent with those of Shah and Sana (2005) who found a non-significant, but positive relationship between ADR and profitability in Pakistan's Oil and Gas industry.

However, the finding in respect of ADR and profitability relationship, which indicates a non-significant relationship with profitability, appears to be inconsistent

with some past studies (Akoto et al., 2013; Deloof, 2003; Sharma and Kumar, 2011; Tauringana and Afrifa, 2013; Stephen and Elvis, 2011).

#### **5.2.5 Relationship between ADP and profitability**

This study found that the relationship between ADP and ROA is negative and significant. Therefore, hypothesis four was supported. Thus, ADP is the most significant factor in determining profitability in the sampled PRFs.

This implies the less the sampled firms delay in paying creditors, the more they increase profitability in terms of ROA. A reduction of ADP by -1.197 will cause a one percent increase in profitability of the firms.

This finding is similar to those of Adjei and Yeboah (2011), Falope and Ajilore (2009), Raheman and Nasr (2007), Sharma and Kumar (2011) and Tauringana and Afrifa (2013).

However, the finding on ADP and profitability relationship contrasts those of Gill et al. (2010) and Shah and Sana (2005) who found a non-significantly positive relationship between ADP and profitability in Pakistan's Oil and Gas industry.

#### **5.2.6 Findings from the Interviews**

The main challenges the five PRFs faced with cash management were:

Difficulty in providing collateral security to banks for credit facilities to run business.



Cash handling problems such as pilfering at the sales points is still a challenges.

The movement of cash to the bank also tend to be a challenge due to attacks from armed robbers and the likelihood of money getting missing.

There are also frequent attacks from armed robbers at retail fuel sites.

The main challenge these PRFs face, according to the managers, is pilfering of the stock of fuel while in transit. They mentioned that sometimes transporters steal some of the stock from the Oil Mining Companies (OMCs) to the PRFs site.

With ADR, the key challenges faced by the five firms relating to debtors were that:

Debtors do not keep to their agreement. There is frequent default in payments which affect WCM in the firms seriously. This was consistent with the descriptive analysis and regression results because J-LTD recorded a mean NWC from 2008 to 2013 of GHS -62455.17, and J-LTD had a worse ADR as high as 25.519 times company E ( $\beta = 25.519$ ).

Increasing fuel prices in Ghana also put more pressure on the PRFs to demand for more WC to manage their current liabilities.

The only challenge the PRFs have with suppliers, the OMCs, is that the process of getting contractual agreements completed appears too cumbersome with many documentations and demand for collateral security from the PRFs. This can delay agreements for new orders.

### **5.3 Conclusion of the Study**

The study examined the impact of WCM on profitability of five selected PRFs in the Kumasi Metropolis for the period of six years, 2008 to 2013. Based on objective analysis of the results and findings, this study concludes that, in the PRFs in Kumasi Metropolis, there is positive or favourable net working capital for the firms and a favourable networking capital to total assets ratio. The most important WCM component that drives the firm's profitability, measured in ROA, is average days payable (ADP). The rest of WCM components, CCC, ADI and ADR did not have significant relationship with profitability. While the findings of this study are consistent with many previous research, especially in a similar petroleum industry like Shah and Sana (2005), it contradicted the findings in some previous studies. The findings have important implications for both WCM theory and management of small and medium scale petroleum retail firms.

### **5.4 Implications and Recommendations of the Study**

This study offer important theoretical implications and managerial recommendation towards managing working capital in the selected PRFs in the Kumasi Metropolis.

#### **5.4.1 Theoretical Implications**

This study is among the few that have examined WCM and profitability relationship in a developing country petroleum industry, apart from the important study of Shah and Sana (2005). This study's findings appears to be consistent in many respect with a similar study by Shah and Sana (2005) in Pakistan's Oil and Gas industry. It, therefore,

suggests that in the petroleum industry in Ghana, ADP appears to be the most significant factor in determining profitability, measured by ROA. Therefore, this study contributes to the literature on WCM in developing countries in general and in petroleum industry in particular since there is no such study in the Sub-Sahara Africa and in Ghana, to the best of the researcher's knowledge.

Moreover, this study confirms that, theoretically the relationship between WCM components and profitability dependents may vary from one industry and context to another. Even within the same industry, there could be significant differences in the influence of CCC on profitability (Shah and Sana, 2005; Vishnani and Shah, 2007). For example, generally, while this study did not find support for CCC, ADI, ADR and profitability confirming similar to findings in previous research (Tauringana and AdjapongAfrifa, 2013; Shah and Sana, 2005), and at the same time contradicting other findings in some previous studies (Deloof, 2003; Tauringana and AdjapongAfrifa, 2013; Stephen and Elvis, 2011). On the other hand, while this study found support for the relationship between ADP and profitability, which is similar to those of Adjei and Yeboah (2011), Falope and Ajilore (2009), Raheman and Nasr (2007), Sharma and Kumar (2011) and Tauringana and AdjapongAfrifa (2013), this finding contradicts other studies, that found a non-significantly positive relationship between ADP and profitability (Gill et al., 2010; Shah and Sana, 2005).

Furthermore, the findings of this study indicate that WCM practices of the five selected PRFs support the conservative strategy of WCM. Therefore, given the positive

relationship of between profitability and CCC, ADR and not ADI, and a negative effect of ADP on profitiability, it appears a more conservative strategy, and not an aggressive WCM strategy (Tauringana and Afrifa, 2013).

This study also found support for the controlled variables that can affect the estimation of firm profitability. Previous research indicate that many factors such as industry effect, firm effect, financial strategy effects as well as size of the firm (TauringanaandAfrifa (2013, p. 456). Consistent with prior research, this study has confirmed that factors such as quick ratio (QR), leverage (LEV) and firm size (TALOG) with the exception of ADI/CA and CA/TA).

#### **5.4.2 Recommendations to Management**

The following are some of the recommendation to management for improving upon WCM in the PRFs.

##### **Improving management of average days of payables**

Since the study found that ADP is negatively associated with profitability significantly, and is the only significant factor, management should pay more attention to ADP management and seek to improve upon it. According to the findings, the more the firms delay in paying creditors, the more they increase profitability in terms of ROA. Specifically, a reduction of ADP by -1.197 will cause a one percent increase in profitability of the firms.



Management of the firms should note that the significance of ADP on profitability occurred together with the significance of three control variables, QR, LEV and TALOG. Therefore, the management should seek to improve upon ADP together with QR, LEV and TALOG. While firm size (TALOG) is not easily changeable in the short-run, Quick ratio (QR) and firm Leverage (LEV) should be improved significantly to boost profitability of the firm.

For the individual firms, the strength of the effect of ADP on profitability is about 15.79 times stronger than in J-LTD more than it is in E-LTD. Similarly, the strength of the effect of ADP on profitability is about 9.95 times stronger than in M-LTD more than it is in E-LTD. The results suggest that the relationship between ADP and profitability might be significant in some firms and non-significant in others. This implies that the firms might have different working capital needs, and pursuing different WCM strategies and focus.

### **Strategies to overcome challenges**

In order to overcome their existing challenges, the following strategies are recommended to relevant stakeholders. To management, there should be:

Effective monitoring of cash deposit in safes at sales point.

Provision of security personnel armed with guns to protect and deter armed robbers from attacking the sales points.

Security personnel to accompany the movement of cash to the bank and inventory to sales points should be accompanied by security personnel always to prevent

likelihood of loss of fuel in transit.

Periodic training and education in business ethics to instill trust and good professional conduct in staff in the area of inventory management, cash management and customer relationship management.

Effective debt collection mechanism should be developed to reduce the frequent default in payments by business partners, which affect WCM in the firms seriously.

#### **Effort of industry regulators**

Industry regulators should improve upon measures to facilitate speedy contractual agreements between the PRFs and the OMCs, to avoid unproductive delays in business transactions resulting from cumbersome documentations processes and demand for collateral security from the PRFs.

#### **5.5 Recommendation for Further Research**

This study examined the impact of WCM on profitability of five selected PRFs using secondary data, financial statements, and interviews in a quantitative study. Future research should be done to include a wider number of PRFs to provide a more generalizable findings, and compare the results with that found in this study. Moreover, the measure of profitability in this study was return on assets (ROA), future research should be done to find out the impact of WCM on other measures of profitability such as return on equity (ROE), firm growth and net trade cycle

It is recommended that future research could be done in the following areas: A comparative study of working capital management of petroleum firms and stock exchange market firms in Ghana.

Working Capital Management of Higher Educations in Ghana.

Working management practices of Oil Manufacturing Companies in Ghana Ethical

Considerations in Working Capital Management in Petroleum Retail

Firms in Ghana.

The logo of KNUST (Kwame Nkrumah University of Science and Technology) is centered in the background. It features a yellow eagle with spread wings, a red and black shield on its chest, and a red flame above its head. The text 'KNUST' is written in large, semi-transparent letters across the middle of the page.

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## APPENDIX1

### INTERVIEW GUIDE FOR MANAGERS OF SELECTED PETROLEUM RETAIL FIRMS

**MODERATOR:** Researcher

**PARTICIPANTS:** Managers of selected petroleum retail firms in Kumasi

**PURPOSE:** Dear Sir/Madam, the purpose of this interview is to explore the challenges managers face with working capital management in petroleum retail firms in the Kumasi Metropolis. Your responses will be used for only academic purpose and your identity will not be disclosed.

#### INTERVIEW QUESTIONS

1. Please mention identify your company – age range, number of employees, annual turnover range,
2. Please what are the challenges you face with the following aspects of working capital management and profitability of your retail firm?

Profitability		MANAGER'S RESPONSE:
ROA	<i>Return on assets, measured as profit before interest and tax for the year scaled to the total assets at the end of the financial year.</i>	
Working Capital Management		MANAGER'S RESPONSE
CCC	<i>The Cash Conversion Cycle which represents the average timing difference between when a firm pays for its suppliers and the time it takes to recoup amount invested in debtors and inventory.</i>	
ADI	<i>Inventory holding period (ADI). This represents the average number of days a company is holding the inventory.</i>	MANAGER'S RESPONSE:
ADR	<i>Accounts receivables (ADR) represents the average number of days the firm takes to collect receivables from customers.</i>	MANAGER'S RESPONSE:
ADP	<i>Accounts payable (ADP) is the average number of days it takes a firm to pay trade creditors.</i>	MANAGER'S RESPONSE:

**Thank you for your time and effort in this interview**



**APPENDIX 2 SUMMARY OF  
RELEVANT FINANCIAL STATEMENT**

<b>E Limited</b>	<b>2013</b>	<b>2012</b>	<b>2011</b>	<b>2010</b>	<b>2009</b>	<b>2008</b>
	GH¢	GH¢	GH¢	GH¢	GH¢	GH¢
OPENING INVENTORY	247,555.26	188,632.01	126,398.62	116,295.87	62,924.00	-
CLOSING INVENTORY	254,866.75	247,555.26	188,632.01	126,398.62	116,295.87	62,924.00
AVERAGE INVENTORY	251,211.01	218,093.64	157,515.32	121,347.25	89,609.94	62,924.00
COST OF GOODS SOLD	12,923,837.78	10,100,555.88	6,472,919.57	5,143,889.25	5,039,735.70	4,869,223.00
AVERAGE ACCOUNTS RECEIVABLE	74,477.90	19,597.40	75,010.83	63,410.81	59,752.00	40,636.00
CREDIT SALES	864,088.24	207,531.67	655,643.93	527,001.34	516,736.87	392,703.04
AVERAGE ACCOUNTS PAYABLE	510,022.00	342,399.00	304,397.88	239,230.86	12,507.00	18,386.00
CREDIT PURCHASES	12,923,837.78	10,100,555.88	6,472,919.57	5,143,889.25	755,960.36	730,383.45
NET PROFIT BEFORE TAX	30,826.62	19,345.40	10,528.39	4,477.29	1,095.34	- 1,540.65
SHAREHOLDERS' EQUITY	135,887.66	113,307.84	102,621.74	117,266.01	115,281.98	116,698.85
NET ASSETS	135,887.65	113,307.84	102,621.75	117,266.01	115,281.98	116,698.85
SALES	17,281,764.84	10,376,583.47	6,556,439.30	5,270,013.44	5,167,368.73	4,908,788.00
RETURN ON ASSETS (ROA)	23%	17%	10%	4%	1%	-1%
AVERAGE DAYS INVENTORY	7	8	9	9	6	5
AVERAGE DAYS RECEIVABLE	31	34	42	44	42	38
AVERAGE DAYS PAYABLE (Days)	14	12	17	17	6	9
CASH CONVERSION CYCLE	24	1	33	36	43	33
<b>J K LIMITED</b>	<b>2013</b>	<b>2012</b>	<b>2011</b>	<b>2010</b>	<b>2009</b>	<b>2008</b>

	GH¢	GH¢	GH¢	GH¢	GH¢	GH¢
OPENING INVENTORY	186,343.00	242,497.00	200,877.00	122,802.00	83,866.00	24,011.00
CLOSING INVENTORY	261,918.00	186,343.00	242,497.00	200,877.00	122,802.00	83,866.00
AVERAGE INVENTORY	224,130.50	214,420.00	221,687.00	161,839.50	103,334.00	53,938.50
COST OF GOODS SOLD	13,471,680.00	11,910,749.00	11,810,261.00	5,761,608.00	4,528,324.00	4,221,100.00
AVERAGE ACCOUNTS RECEIVABLE	77,160.00	194,225.00	35,266.00	2,750.00	-	11,320.00

CREDIT SALES	702,494.85	1,824,411.75	364,065.96	29,701.46	233,646.95	129,110.88
AVERAGE ACCOUNTS PAYABLE	314,991.00	270,198.00	190,030.00	170,133.00	22,378.00	-
CREDIT PURCHASES	13,471,680.00	11,910,749.00	11,810,261.00	5,761,608.00	679,248.60	633,165.00
NET PROFIT BEFORE TAX	135,864.00	101,909.00	97,066.00	29,941.00	4,096.00	5,157.00
SHAREHOLDERS' EQUITY	500,693.00	377,329.00	255,934.00	113,540.00	20,467.00	17,152.00
NET ASSETS	500,693.00	377,329.00	255,934.00	113,540.00	20,467.00	17,152.00
SALES	14,049,897.00	12,162,745.00	12,135,532.00	5,940,291.00	4,672,939.00	4,303,696.00
RETURN ON ASSETS (ROA)	27%	27%	38%	26%	20%	30%
AVERAGE DAYS INVENTORY	6	7	7	10	8	5
AVERAGE DAYS RECEIVABLE	40	39	35	34	-	32
AVERAGE DAYS PAYABLE (Days)	9	8	6	11	12	-
CASH CONVERSION CYCLE	38	37	36	33	-4	37

<b>SKA LIMITED</b>	<b>2013</b>	<b>2012</b>	<b>2011</b>	<b>2010</b>	<b>2009</b>	<b>2008</b>
	GH¢	GH¢	GH¢	GH¢	GH¢	GH¢
OPENING INVENTORY	107,746.40	274,518.25	151,459.40	149,556.17	160,430.81	137,086.00
CLOSING INVENTORY	559,151.18	107,746.40	274,518.25	151,459.40	149,556.17	160,430.81

AVERAGE INVENTORY	333,448.79	191,132.33	212,988.83	150,507.79	154,993.49	148,758.41
COST OF GOODS SOLD	16,428,852.02	10,597,495.85	10,182,962.41	6,578,470.62	5,061,745.51	5,190,208.19
AVERAGE ACCOUNTS RECEIVABLE	259,268.00	322,322.24	35,515.80	32,515.80	20,503.33	57,835.51
CREDIT SALES	2,522,654.10	3,255,366.36	420,626.36	338,860.86	207,865.94	635,085.60
AVERAGE ACCOUNTS PAYABLE	591,501.06	247,728.25	443,269.53	222,015.70	138,124.83	37,515.51
CREDIT PURCHASES	16,428,852.02	10,597,495.85	10,182,962.41	6,578,470.62	3,376,184.26	1,038,041.64
NET PROFIT BEFORE TAX	35,050.07	30,753.37	21,010.46	2,029.83	4,656.84	- 274.19
SHAREHOLDERS' EQUITY	213,562.40	199,072.40	105,877.88	76,852.16	75,602.55	72,145.71
NET ASSETS	213,562.40	199,072.40	105,877.88	76,852.16	75,602.55	72,145.71
SALES	16,817,694.00	10,851,221.20	10,515,658.97	6,777,217.24	5,196,648.55	4,233,904.00
RETURN ON ASSETS (ROA)	16%	15%	20%	3%	6%	-0.4%
AVERAGE DAYS INVENTORY	7	7	8	8	11	10
AVERAGE DAYS RECEIVABLE	38	36	31	35	36	33
AVERAGE DAYS PAYABLE (Days)	13	9	16	12	15	13
CASH CONVERSION CYCLE	32	34	23	31	32	31

<b>LA LIMITED</b>	<b>2013</b>	<b>2012</b>	<b>2011</b>	<b>2010</b>	<b>2009</b>	<b>2008</b>
	GH¢	GH¢	GH¢	GH¢	GH¢	GH¢
OPENING INVENTORY	208,686.88	279,881.07	151,578.49	143,723.06	1,558.00	1,377.83
CLOSING INVENTORY	181,891.05	208,686.88	279,881.07	151,578.49	143,723.06	1,558.00
AVERAGE INVENTORY	195,288.97	244,283.98	215,729.78	147,650.78	72,640.53	1,467.92

COST OF GOODS SOLD	9,247,367.27	7,214,095.92	6,651,377.83	4,579,602.47	2,953,077.29	2,048,101.22
AVERAGE ACCOUNTS RECEIVABLE	154,191.91	200,414.34	26,281.44	74,970.88	5,090.01	255.00
CREDIT SALES	1,432,097.88	2,219,149.30	275,318.23	705,994.23	60,485.54	20,908.03
AVERAGE ACCOUNTS PAYABLE	173,643.02	230,692.00	291,765.88	187,332.60	101,219.15	-
CREDIT PURCHASES	9,247,367.27	7,214,095.92	6,651,377.83	4,579,602.47	2,953,077.29	2,048,101.22
NET PROFIT BEFORE TAX	38,716.41	31,790.24	7,512.58	4,887.98	- 13,665.05	22,102.99
SHAREHOLDERS' EQUITY	93,349.84	90,485.59	91,665.64	110,906.93	118,568.95	141,434.00
NET ASSETS	93,349.84	90,485.59	91,665.64	110,906.93	118,568.95	141,434.00
SALES	9,547,319.22	7,397,164.32	6,882,955.70	4,706,628.17	3,024,277.00	2,090,803.06
RETURN ON ASSETS (ROA)	41%	35%	8%	4%	-12%	16%
AVERAGE DAYS INVENTORY	8	12	12	12	9	1
AVERAGE DAYS RECEIVABLE	39	33	35	39	31	1
AVERAGE DAYS PAYABLE (Days)	7	12	16	15	13	-
CASH CONVERSION CYCLE	40	34	31	36	27	2
<b>MED LIMITED</b>	<b>2013</b>	<b>2012</b>	<b>2011</b>	<b>2010</b>	<b>2009</b>	<b>2008</b>
	GH¢	GH¢	GH¢	GH¢	GH¢	GH¢
OPENING INVENTORY	193,818.21	367,216.45	215,574.42	264,123.70	20,711.17	28,951.30
CLOSING INVENTORY	722,405.99	193,818.21	367,216.45	215,574.42	264,123.70	20,711.17
AVERAGE INVENTORY	458,112.10	280,517.33	291,395.44	239,849.06	142,417.44	24,831.24
COST OF GOODS SOLD	19,112,836.54	14,259,563.23	13,453,537.09	7,676,540.98	8,481,677.00	5,493,175.86
AVERAGE ACCOUNTS RECEIVABLE	215,746.47	147,833.64	98,924.91	59,752.00	34,263.57	34,549.66
CREDIT SALES	2,151,471.56	1,459,706.11	972,068.77	625,215.96	347,805.72	335,809.55
AVERAGE ACCOUNTS PAYABLE	883,223.69	655,046.12	625,947.17	292,444.33	332,551.04	144,240.84
CREDIT PURCHASES	19,112,836.54	14,259,563.23	13,453,537.09	7,676,540.98	8,481,677.00	5,493,175.86



NET PROFIT BEFORE TAX	22,464.32	14,264.46	22,575.60	19,415.67	27,314.53	13,553.52
SHAREHOLDERS' EQUITY	123,871.97	105,376.74	84,005.10	66,907.23	106,159.60	42,845.07
NET ASSETS	123,871.97	105,376.74	84,005.10	66,907.23	106,159.60	42,845.07
SALES	19,558,832.36	14,597,061.12	13,886,696.72	7,815,199.53	8,695,143.03	5,596,825.91
RETURN ON ASSETS (ROA)	18%	14%	27%	29%	26%	32%
AVERAGE DAYS INVENTORY	9	7	8	11	6	2
AVERAGE DAYS RECEIVABLE	37	37	37	35	36	38
AVERAGE DAYS PAYABLE (Days)	17	17	17	14	14	10
CASH CONVERSION CYCLE	28	27	28	32	28	30

### APPENDIX 3

#### DEFINITION OF RESEARCH VARIABLES USED IN REGRESSION MODELS

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##### Profitability

Return on assets, which is estimated as profit before interest and tax for the year as a ratio of the

ROA  $\frac{\text{Profit before interest and tax for the year}}{\text{total assets at the end of the financial year}}$

Working Capital Management CCC

The CCC is estimated as  $ADI + ADR - ADP$ , which signifies the average length of period it takes for a company to make payments to its creditors for supplies and the period it takes to regain the funds invested in inventory and debtors.

ADI

Average days of inventory (ADI) is estimated by dividing inventory by cost of sales multiplied by 365 days.

ADR

Accounts receivables (ADR) represents the average number of days the firm takes to collect sales from debtors. This is calculated by dividing accounts receivables by sales times 365 days ADP

Average days accounts payable (ADP) is the average number of days a firms takes to pay suppliers. This is computed by dividing accounts payables by cost of sales multiplied by 365 days.

**Variables controlled**

QR Quick ratio is calculated by current assets minus inventory divided by current liabilities

ADI/CA Inventory to current assets calculated by dividing inventory by current assets

CA/TA Current asset to total asset is calculated by dividing current assets by total assets

CA\_TURN Current assets turnover is calculated by dividing total assets by turnover

LEV Leverage is calculated by dividing total debt by total assets

TALOG Logarithm of total assets is est by estimated by finding the logarithm of the total assets figure

$i$  The subscript  $i$  denotes the  $i$ th company ( $i = 1; \dots; 6$ ) for six companies and the subscript  $t$  denotes the  $t$ th year ( $t = 1, \dots, 5$ ) for data for five years.

$\epsilon_{it}$  The error term

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