

**EFFECTS OF WORKING CAPITAL MANAGEMENT ON PROFITABILITY OF
FIRMS IN OIL AND GAS INDUSTRY IN KENYA**

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DECLARATION

I declare that this research project is my original work and has not been presented for examination in any other university or college.

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DEDICATION

I dedicate this research work to my parents and family for their selfless support towards my education.

ACKNOWLEDGEMENT

I thank the Almighty God for guiding me this far in my academic journey.

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TABLE OF CONTENT

DECLARATION	ii
DEDICATION	iii
ACKNOWLEDGEMENT	iv
TABLE OF CONTENT	v
LIST OF TABLES & FIGURES	vii
LIST OF ABBREVIATIONS AND ACRONYMS	viii
ABSTRACT	ix
CHAPTER ONE	1
INTRODUCTION	1
1.1. Background	1
1.1.1 Working Capital Management.....	3
1.1.2 Profitability of Firms	5
1.1.3 Working Capital Management and Profitability	7
1.1.4 The Oil and Gas Industry in Kenya	8
1.2 Research Problem.....	9
1.3 Research Objective.....	11
1.4 Value of the Study.....	12
CHAPTER TWO	13
LITERATURE REVIEW	13
2.1. Introduction.....	13
2.2. Theoretical Review	13
2.2.1. Agency Theory	13
2.2.2 Stakeholder Theory.....	15
2.2.3. Stewardship Theory	16
2.2.4. Baumol Model of Cash Management	18
2.3 Determinants of Profitability in Oil and Gas Industry	19
2.3.1 Working Capital Management.....	19
2.3.2. Size	19
2.3.3. Growth Rate.....	20
2.3.4. Leverage	20
2.3.5. Current Ratio	20
2.4 Empirical Literature	21

2.5 Summary of the Literature Review	24
2.6 Conceptual Framework	24
CHAPTER THREE	26
RESEARCH METHODOLOGY	26
3.1 Introduction.....	26
3.2. Research Design.....	26
3.3. Population and Sampling Procedure	26
3.4. Data Collection	26
3.5. Data Analysis	27
3.5.1 Diagnostic Tests.....	27
3.5.2 Model to Estimate.....	27
3.5.3. Test of Significance	30
CHAPTER FOUR.....	31
RESULTS AND DISCUSSIONS	31
4.0 Introduction.....	31
4.1 Descriptive Statistics.....	31
4.2 Correlation Matrix	32
4.3 Normality Test	33
4.4 Homoscedasticity Test	34
4.5 Hausman Specification Test.....	34
4.6 Estimation results and Discussion.....	35
4.6.1 Interpretation of the Results.	36
4.6.2 Discussion of the Findings	37
CHAPTER FIVE	38
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS.....	38
5.0 Introduction.....	38
5.2 Summary of Findings and Conclusions	38
5.3 Policy Implications and Recommendations	40
5.4 Limitations of the Study.....	40
5.5 Areas for Further Study	41
REFERENCES.....	42
APPENDICES	48

LIST OF TABLES & FIGURES

Table 1: Conceptual Framework.....	25
Table 2: Descriptive statistics	31
Table 3: Correlation matrix.....	32
Table 4: Normality Test	33
Table 5: Likelihood-ratio test for Homoscedasticity	34
Table 6: Hausman Specification Test	34
Table 7: Breusch-Pagan Lagrange multiplier Test	35
Table 8: Pooled OLS Regression Results	35

LIST OF ABBREVIATIONS AND ACRONYMS

CCC	Cash Conversion Cycle
CDF	Cumulative Distribution Function
DIO	Days Inventory Outstanding
DPO	Days Payables Outstanding
DSO	Days Sales Outstanding
ERC	Energy Regulatory Commission
MoEP	Ministry of Energy and Petroleum
NSE	Nairobi Securities Exchange
OTS	Open Tender Systems (OTS)
POLS	Pooled Ordinary Least Square
ROA	Return on Assets
SMEs	Small and Medium Enterprises
WCM	Working Capital Management

ABSTRACT

Working capital management is argued to positively influence profitability of firms across various sectors of an economy. Nevertheless, this is very difficult task for financial managers because of opposing interest of various stakeholders. For example, profit can be maximized if accounts payable are settled after a long period. However, this is against the interest of the creditors. In addition, higher prices and prompt collection of accounts receivable will fetch greater returns but customers will be hurt by such moves. These complexities are even worsened by the volatile nature of the oil and gas industry especially in Kenya. A sound and robust working capital management is thus needed. Thus, this study seeks to establish the effect of working capital management on profitability of oil and gas industry in Kenya. The study sampled ten firms out of which two are listed in the Nairobi Securities Exchange, one is government owned while the other seven are privately owned. Balanced panel data covering 2012-2017 period across the ten firms was obtained from respective firms' annual financial reports and other relevant secondary sources. Data was collected on these firms' Net profit after tax, accounts receivable, accounts payable, sales, purchases, inventory, current assets and current liabilities, total debt and total assets. Pooled ordinary least squares method was used to establish the effects of various WCM components on firm profitability measured using ROE. Correlation analysis was also be used as a complimentary analytical procedure. The study found out that days payables outstanding (DPO) has a significant positive impact on profitability of firms in the Kenyan oil and gas industry. Days sales outstanding (DSO) and days inventory outstanding (DIO) were found to have no significant impact in determining profitability. Liquidity, measured using current ratio, and debt-equity ratio used as control variables were found to be important determinants of profitability; the two ratios had a positive and negative relationship respectively with ROE. The study concludes that WCM is important in determining performance of firms in the oil sector. Finance managers should focus on making appropriate decisions that enhance efficiency in WCM. Supply agreements that allow the company long credit periods to settle their obligations are encouraged as this will affect profits positively. The study recommends that government and other policy makers should come up with a policy that allows oil marketing companies reasonable timelines to settle their obligations on imported products as this will cushion such companies from working capital deficits and losses related to finance charges.

CHAPTER ONE

INTRODUCTION

1.1. Background

During the recent times, working capital management (WCM) has gained popularity as the way to go in ensuring that a firm operates optimally so that it make reasonable financial gains. WCM deals with optimization of a firm's current assets and current liabilities. Maintaining an optimal balance of inventory holding, debtor balances, creditor balances and short term borrowings is key in ensuring continuity of a firm's daily operations and consequently has direct effect on profitability and liquidity of firms. Maintaining optimal stock levels ensures the firm does not run into shortage while minimizing cost of holding excess stock. Quick collection of accounts receivable ensures the company has cash to pay for obligations but this should be done in a manner that does not harm credit customers who prefer favorable credit terms. Lengthening payable deferral period is favorable to the liquidity of the firm but could harm the firm's credit reputation and relationship with key suppliers and as such should be managed at an optimal level. Inappropriate WCM procedures can breed bankruptcy even when books of account indicate positive returns, for example having high level of working capital means a lot of funds, which could otherwise be invested in long term assets, are tied. Thus, firms should strive to maintain an optimal working capital that maximizes shareholders' value.

A number of theories can be used to explain the relationship between working capital management and profitability. These are agency theory, stakeholder theory, stewardship theory and Baumol model of cash management. These theories provide a theoretical basis upon which this study is anchored on. The agency theory as formulated by Coase (1930) and popularized by Ross (1979) and Jensen and Meckling (1976) focuses on the relationship between the agents

and their principals. The agents and principals have divergent interests. Going by the Agency theory, the agents should maintain optimum levels of working capital in order to serve the profit maximization interests of the principals. The stakeholder theory prescribes that the agents serve the interests of various stakeholders such as employees, customers, debtors, creditors and shareholders. These stakeholders have varying interests and thus the agents should ensure an optimal balance. According to the stakeholder theory, agents should properly manage working capital to ensure shareholders' wealth is maximized while taking care of the interests of customers, creditors and other stakeholders. Similarly, appropriate WCM practices require an optimal level of working capital which ensures maximum profit to the shareholders while keeping customers and creditors happy. The Baumol model is relied upon when determining the optimum cash balance a firm should hold in conditions of certainty. Baumol (1952), proposed a model for determining optimum mix between cash and short term investments while considering the market interest rates and the transactional cost of placing and redeeming investments. Cash management is an important component of working capital management and as such Baumol model was a key reference point for this study.

Currently, crude oil is one of the most essential resources in man's daily life. More so, the oil industry is one of the most powerful branches in the global economy. The annual global production of oil is at least 4 billion MT with the Middle East producing nearly one third of this. Saudi Arabia and the US are the global leading producers of oil with each accounting for about 13% while Russia producing over 12% is the world's third largest oil producer (Statista, n.d). The oil and gas companies are among the largest corporations globally with 6 out of the top 10 companies worldwide based on revenue are in the oil industry. The last decades have experienced a steady rise in both the demand and consumption of oil. The United States doubles as a global leading consumer and importer of oil, followed by China in consumption. Due to rising global demand, oil prices remained relatively high until June 2014. In deed the oil prices from 2011 to

2014 were quadruple those in 2001 (Statista, n.d). However, in 2015 and 2016, prices declined significantly. In March 2017, the prices of crude oil as set by OPEC were averagely US \$ 50.32 per barrel after dropping from an average annual price of US \$ 52.03 per barrel in 2016. Nevertheless, the long term viewpoint of the oil industry looks more promising. For example a greater proportion of the worldwide top oil producing countries recorded distinct higher production ceilings in 2020 than it was in 2011. It is also projected that the world will experience an increase in demand of oil until at least 2035. Daily global consumption of oil is expected to increase from 89 million barrels in 2012 to about 109 million barrels in 2035 (Statista, n.d).

1.1.1 Working Capital Management

According to Gitman (2002), working capital implies that part of a company's assets which can be easily varied from one type to another during the firm's daily operations. Working capital can simply be described as the net of current assets less current liabilities. Current assets include cash, inventory, account receivable, short term investments and prepaid expenses among others. On the other hand, current liabilities include account payables, short-term borrowings and current tax liabilities. Working capital management (WCM) is ideally the decision making process by financial managers concerning current assets and liabilities (Khalid et al., 2018). It deals with managing various components of working capital at optimum levels to ensure maximum financial benefit to the company.

Eljelly (2004) and Harris (2005) pointed out that working capital management is greatly involved with maintaining firms' liquidity during their daily operations in order to ensure that they are smoothly run as well as meet their obligations when they fall due. The success of business entities is largely driven by the ability of financial managers to ensure that receivables, inventories and payables are effectively managed (Filbeck & Krueger, 2005). Reduction of financial costs of firms as well as increase in their funds available for expansion projects can be

made possible through minimization of the investment amount locked up in current assets. Lambern (1995 cited in Nazir & Afza, 2009) argued that, financial managers allocate most of their time and efforts towards restoring optimal levels of current assets and current liabilities whenever non-optimality exists. This process requires unceasing monitoring to preserve a suitable level of different working capital components while ensuring that business operations are both efficient and profitable. Without proper WCM practices, a company is likely to have high working capital levels whose opportunity cost is equally high since funds which would otherwise be invested in long term investments are held as current assets. Relationships with other stakeholders such as customers and creditors could be at risk where the firm targets prompt collection of debts while lengthening payables settlement period. On the contrary, maintaining thin stock holdings could land the firm into costly shortages which could lead to loss of clients. It is therefore clear that companies need to put in place appropriate WCM practices for them to remain profitable and as such maximize shareholders wealth.

According to Sharma and Kumar (2011), WCM is popularly measured using cash conversion cycle (CCC). This is the duration between when expenditure for purchase of raw material is made and when payments from sales of finished products are collected. Investment in working capital (WC) increases with an increase in this time lag. In addition to cash conversion cycle, there are other ratios which are used to measure WCM and these include day's sales outstanding, average age of inventory, day's payable outstanding, operating cycles among others. The development of the concept cash conversion cycle is accredited to Richards and Laughlin (1980). The CCC implies the number of days that elapses from the time when a firm incurs expenses for its raw materials up to when it collects cash from the sale of its finished products (Sharma & Kumar, 2011). Richard and Laughlin (1980) asserted that CCC is an important tools employed while assessing the efficiency of WCM. According to Bieniasz and Golas (2011), CCC is a synthetic tool formed from three partial cycles. In a similar manner, it

was asserted by Alipour (2011) that CCC has been introduced by renowned researchers such as Shin and Soenen (1998) as a measure of effective WCM. The accounts receivables, accounts payables and inventories are the major constituent parts of working capital. Deloof (2003) argued that for firms to maximize their profits and/or increase their values, these parts should be managed in different but efficient ways. Aminu, and Zainudin (2015) summarizes the CCC as follows:

$$CCC = ACP + ICP - APP \quad (1.1)$$

Where,

ACP = Average collection period, a proxy for receivable management

ICP = Inventory conversion period, a proxy for inventory management

APP = Average payment period, a proxy for payables

1.1.2 Profitability of Firms

Profit refers to how much income or revenue exceeds costs or expenses of a company often measured in absolute numbers. Profit maximization is the central goal of most business entities (Horton, 2018). Unlike profit which refers to an absolute amount, profitability is relative. Profitability shows the relationship between income and selected balance sheet number as a measure of the relative ability to earn income on assets. Profitability is used in determining the scope of the profits of a firm in relation to its size. Profitability measures efficiency and the ultimate success or failure of a firm (Horton, 2018). Profitability can further be used to mean the firm's ability to yield a return on an investment based on its resources as compared to an alternative investment. It should also be noted that by a firm realizing profit, it does not necessarily imply it is profitable (Horton, 2018).

There is a universal consensus that firms as economic agents often pursue profit maximization motive with the focus of ensuring that the value of the shareholders' wealth is maximized. Agha (2014) alluded that profit can be estimated by subtracting expenses incurred by a firm from the revenues realized. This paints profitability as a good indicator for firm's performance. Therefore, profitability can be used a proxy for companies' performance. In addition, firms strive to remain as going concerns in the business world and this can only be guaranteed if they turn out to be profitable.

In their desire to maximize profits, firms execute project that yield net present value (Owolabi & Alayemi, 2013). This has piled pressure on management teams across firms to be increasingly concerned with the efficient utilization of assets in an effort to drive up the performance of business entities (Siminica, Circiumaru & Simon, 2012). Pressure from shareholders augmented by scarcity of funds has coaxed management of firms to device approaches to heighten their efficiency which insulates this firms against dangers from stiff competition. In order for companies to achieve this, assessment of the link between profitability, sales and current operating assets is inevitable (Owolabi & Alayemi, 2013). According to existing empirical literature (see for example, Vuran & Adiloglu, 2018; Agha, 2014; Nazir & Afza, 2009), profitability of firms is assessed by examining their return on assets (ROA). However, other measures can be used; for example, Gill, Biger and Mathur (2010) and Raza, Bashir, Latif, Shah and Ahmed (2015) used gross operating profit. ROE is a ratio of net annual income divided by the total equity (shareholders' funds) of a business entity in a given financial year. The return on equity is a profitability ratio which indicates the performance as well as progress of a firm in resource utilization to generate gains for shareholders (Agha, 2014).

1.1.3 Working Capital Management and Profitability

It has already been mentioned that, WCM is a vital factor in financial matters of companies for it directly and positively affects their profitability and liquidity. Profitability and liquidity are two sides of a single coin. Optimal liquidity level guarantees a business to settle its short term debts whereas properly managed cash flows can be assured by a profitable firm. Liquidity reflects the ability of a firm to respond to short-term obligations (Agha, 2014). Therefore, while conducting their day to day operations, firms have to optimize both their liquidity and profitability. A working capital balance which is properly optimized implies keeping the WC requirement at levels as low as a possible while reaping the possible maximum revenue (Ganesan, 2007). More so, Agha (2014) argued that there is existence of a strong linear relationship between a firm's profitability and its working capital efficiency.

As aforementioned, cash conversion cycle has been extensively used as a measure of working capital management of firms. Sharma and Kumar (2011), noted that a longer time lag of this nature expands the investment in WC. Furthermore, profitability is likely to be increased whenever a firm records shorter CCC. Nonetheless, corporate profitability might as well dampen with CCC if the costs incurred during higher investment in working capital escalate at a rate higher than that at which benefits of holding inventory or that at which more trade credit is granted to customers (Sharma & Kumar, 2011). A substantial number of researchers, (see for example Shin & Soenen, 1998) have outlined the significance of shortening CCC since managers can hopefully create value for shareholders through reduction of the cycle to sensible minimum. Generally, as Ali and Ali (2012) pointed out, most of the researches have revealed a positive impact of WCM decisions on organizations' profitability. This general observation conforms the theoretical postulation of the agency theory, stakeholder theory and stewardship

theory, all of which argue that agents through their decision and activities serve the profit interests of the shareholders. Thus the positive effect of WCM on profitability of firms.

1.1.4 The Oil and Gas Industry in Kenya

Petroleum is one of the most important form of modern primary energy not only in Kenya but across the globe. Petroleum accounts for nearly 30% of Kenya's annual imports. The consumption of petroleum in Kenya has been increasing over time. Given the desired 10% economic growth to achieve vision 2030, consumption of petroleum is projected to grow from 4.5 million MT in 2015 to 12 million MT by 2030 (Hassan–Athmani, 2015). It should also be noted that Kenya has travelled through a long oil and gas exploration journey. In particular, Hassan–Athmani (2015) noted that Kenya has morphed from a state of merely commencement of oil exploration in 1950s to the 2012 Ngamia-1 Discovery.

The Kenyan oil and gas industry is a rather dynamic and competitive environment with about 84 active oil marketing companies. These companies are registered by the Ministry of Energy and Petroleum. Furthermore, the Ministry uses Open Tender Systems (OTS) to control 100% of fuel imports into the country. Prices of oil products in the country are based on international oil prices as published by Platts International for the Arab Gulf market. These prices are highly volatile which impacts significantly on the local prices which. Despite struggling to cope with this volatile nature of oil prices, firms also have to adhere to local price regulations by the Energy Regulatory Commission (ERC) of Kenya which publishes maximum retail prices on a monthly basis. Additionally, the tax environment in the Oil industry is equally tough with government recently imposing an 8% VAT on fuel products besides the already existing duties and levies. This saw fuel prices hike in the country.

It was also noted by Wanyonyi and Jagongo (2016) that the energy and petroleum industry requires high intensity of working capital due to volumes involved and volatility of the global market for oil, pricing as well as the volatility experienced in the market for currency which necessitates use of WCM in bringing attractive returns to shareholders. It is this volatility that made the government to put in place regulatory measures to cushion consumers from oil and gas providers who would otherwise charge exorbitant prices so as to reap super normal profits (Ondari, 2010). Due to price volatility there are high risks involved such as huge losses due to holding high stock when prices are going down. On the other hand, holding huge stocks when prices are on the rise will be profitable to the firm. Thus, this volatile nature of oil prices calls for proper management of stock holding lest the firms will plunge into financial meltdowns.

1.2 Research Problem

Efficient management of working capital has been acclaimed both by WCM theories and empirical studies as a key and direct influencer of a firm's profitability and liquidity. It has also been argued that inappropriate WCM practices can cause bankruptcy even in cases where firms record positive profits (Samiloglu & Demirgunes, 2008). It is also worthwhile noting that, if a firm maintains current assets in excess, then it will suffer the opportunity cost of unearned returns could it have been that such asset/funds were invested in long term ventures. On the other hand, if firms maintain current assets at levels below the optimal threshold, they will eventually slide into operational crisis due to inadequacy of funds (Sharma & Kumar, 2011). This leaves working capital management as a worthwhile avenue to explore in ensuring that firms strike favorable balances between their current assets and liabilities. The rationale of the concept of WCM concept is even augmented by the fact that it is a road map to shareholders' wealth maximization as reflected by the respective firm's profitability.

Although firms strive to maximize their profits, such attempts within the oil and gas industry especially in Kenya are met with resistance due to regulatory economic systems. Firms in this sector are exposed to fragile market characterized by lots of uncertainties including price volatility as a result of fragile oil prices which are dictated by global market prices. In spite of these uncertainties that puts profits of relevant firms at risk, the Kenyan government through its ERC continues to set prices which from the public interest theory point of view serves the interests of the public by cushioning consumers against unnecessarily high prices from exploitive providers of oil and gas products (Ondari, 2010). Volatility of prices calls for stringent stock-level management procedures to avoid a situation where the firm is holding huge volumes of stock when prices are going down as this can cause losses. Conversely, holding huge volumes of stock is favorable in situations where prices are upward moving.

Even though the firms have to adhere to oil price restrictions by the government, they are denied the opportunity of freely importing their own fuel as the importation of the commodity is 100% done through the OTS. OTS agreement allows OMCs only 5 days after discharge of imported fuel at Mombasa port to pay the importer failure to which they are heavily penalized. This implies that firms have to quickly solicit funds from sources such as their cash reserves or bank loan which attract interest. This is especially so because firms will take longer sell their stocks (Inventory holding period) and will often sell in credit (days sales outstanding); as such they may not raise enough cash to pay suppliers within 5 days. Additionally taxes in form of duties, levies and VAT charged by the government of Kenya are prepaid before the OMC can access their product thus putting extra financial constraint on such firms. This complex business environment necessitates proper cash management to ensure a firm remains liquid.

The relationship between working capital and profitability of firms has been studied extensively especially in the recent past. Most of these studies have been beyond the Kenyan borders. For example, Mbawuni, Mbawuni and Nimako (2016) revealed that in petroleum retail firms there

existed a favorable networking capital to total asset ratio. More so, average days payable was noted as the major WCM component that drives profitability of firms measured by ROA. In another study, Bhutto, Abbas, ur Rehman and Shah (2015) concluded that sales revenue, return on equity and financing policies are negatively affected by the length of CCC but this length is positively related to total assets, ROA and investment policies. Samiloglu and Akgün (2016) revealed a negative and significant relationship between account receivable period and ROA, return on equity (ROE), operating profit margin as well as net profit margin. Moreover, Vural, Sökmen and Çetenak (2012) noted that increase in leverage level has the effect of reducing a firm's profitability and value.

It is worthwhile noting that a number of studies have also been conducted in Kenya. These include Wanyonyi and Jagongo (2016) who established a positive relationship between WCM and financial performance (profitability) of energy and petroleum companies in Kenya. Afande (2015) and Makor and Jagongo (2013) among other studies demonstrated that efficient WCM raises profitability. Although previous studies have examined the link between WCM and profitability of firms, most of them have been conducted outside Kenya and even those within Kenya did focus on the entire energy and petroleum industry with little specific attention on oil and gas industry and those that toed this route narrowed their scope to firms listed on Nairobi Securities Exchange (NSE). Thus this research seeks to close the gap by conducting a census of the firms in the oil and gas industry in Kenya. This study seeks to answer the question: What is the effect of working capital management on the profitability of firms in the oil and gas industry in Kenya?

1.3 Research Objective

To establish the effect of working capital management on the profitability of firms in the oil and gas industry in Kenya.

1.4 Value of the Study

This study will benefit various parties. One group of beneficiaries will be researchers. To this group, the study extends the existing literature on the relationship between working capital management and profitability of firms.

Other than the researchers, the study will also be useful to the financial management teams of firms especially in the oil and gas industry. This team will get more insights on the implication of working capital management on profitability especially because of the highly volatile and highly regulated nature of the industry in which they operate. This will serve as a starting point for more sound decision making.

In addition, the results may act as a guide to regulatory government authorities on matters of how to govern the industry. Oil and gas as sources of energy are very important towards economic prosperity of any nation and therefore the sector should be regulated with caution to avoid institution of damaging regulations. The study result thus act as an informer on the appropriate policies that will make the industry effective in propelling economic prosperity without comprising the performance of the involved firms.

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

This chapter covers a review of literature related to the topic of the study. The chapter starts with a theoretical review before proceeding to a discussion on determinants of profitability. The chapter then switches its gears to cover some selected empirical studies. The chapter then ends with a presentation of the summary of the literature.

2.2. Theoretical Review

In this sub-section, the paper reviews some selected few theories relevant to the study. In particular, this section reviews selected theories related to working capital management which are agency theory, stakeholder theory and stewardship theory.

2.2.1. Agency Theory

The agency theory traces its roots in private tight theories which are famously noted to have been developed by Coase in the 1930 (Shankman, 1999). However, it is the seminal work of Ross (1973) and a related work by Jensen and Meckling (1976) that greatly inspired the intellectual development of agency theory in the field of organizational economics. Shankman, (1999) noted that the agency theory has been applied by scholars across different fields such as finance, economics, accounting, political science, organizational behavior and sociology.

In particular, the agency theory's main focus is the relationship in which the agents are faced with certain obligations which they must fulfil for the principal as often articulated in contracts between the two parties in respect to the nature of their economic relationships. This theory is

founded on two key assumptions: first, the principals have goals that conflict with those of the agent and second, it is difficult and/or expensive for the principals to monitor the actions taken by the agents and hence resulting into agency problem (Eisenhardt, 1989). More so, the two parties (agents and principals) differ in their attitudes toward risks such that if subjected to the same conditions, they will make different decisions. The interests of the two often differ but agents incur ex-ante bonding cost which are steps taken by the agents to demonstrate that they are committed to serve the interests of the principals. Generally, the agency theory calls for appropriate mechanisms of governance between the two so that their interests are properly aligned.

The agency relationship is commonly described in the view of the principal-agent where firms' managers are regarded as agents and the shareholders as the principals. These principals make investments with the primary focus of increasing their wealth (Quinn & Jones, 1995). Based on this, Shankman, (1999) argued that the underpinning conditions here is for managers to act only in a manner that the firm will maximize its net present value. Intuitively, agency theory is a very instrumental approach in guiding financial managers while making decisions regarding establishing an optimal balance between current assets and current liabilities. These decisions amounts to WCM which has the ability of increasing profitability of the firm (serving the interest of the principal). How relevant the agency theory is to WCM can be viewed from financial managers' perspective. These financial managers are agents of the principals of firms and make all critical decisions pertaining short-term assets and liabilities of firms. In particular, these decisions which amounts to WCM covers receivables, payables and inventories. Such decisions are made with consideration of the profit maximization motive of the principal. In deed it is the linkage between these concepts that this study intends to investigate.

2.2.2 Stakeholder Theory

It is the seminal work of Freeman (1984) that was behind the intellectual development of stakeholder theory into its modern version. Before Freeman's work, there was a persistent struggle to find out if there was any duty of corporation to any other group apart from shareholders, employees, customers and suppliers (Shankman, 1999). There are many articles and books written using the stakeholder theory as a firm's fundamental model (Donaldson & Preston, 1995). Parties that qualify to be stakeholders have been identified by numerous definitions. A broad approach perceives stakeholders as any person(s) either with interest in an organization or are affected by it (Freeman, 1984). Mid-range theories consider stakeholders to be those individuals or groups who to some extent bear risk with the firm (Clarkson, 1995). Finally, the narrow view perceives stakeholders as only those who relate to the firm in a primarily economic way (Friedman, 1970).

In the view of instrumental stakeholder theory, the duty of management is considered to be attaining a balance between the interests of all stakeholders. Indeed, it is contended that a firm can only survive as well as achieve its other performance goals if the said balance is appropriately maintained. According to Carroll (1989 cited in Shankman, 1999), the main condition underlying the instrumental stakeholder theory is that the management must deliver returns to stakeholders in order to sustain an entity as a going concern through continued wealth creation. To this end, it is clear that financial managers should strike a balance between serving the divergent interests of several stakeholders. For example, for any entity to be more profitable (serving interest of the shareholders), it should take long to settle the accounts payable (creditors). In the contrary, it is in the interest of the creditors that they are settled promptly. It should also be noted that consumers desire to be charged low prices. These controversies are augmented by the fact that debtors also expect to be allowed longer time before settling their

accounts yet the firms needs this to be done soonest. These highly contradicting interests from the various stakeholders leaves the financial executives with no option other than ensuring that the WCM of firms are well maintained if the shareholders' wealth is to be maximized without adversely stumbling on the interests of other stakeholders. The symbiotic relationships noted here i.e. between a firm and its creditors; a firm and its customers; a firm and its employees and between a firm and its shareholders requires that the interests of each part should be served yet they are seemingly in opposition to each other. The theory implies making appropriate decisions to control all these. Such decisions are ideally WCM. This study thus considers WCM and focuses on how it affects the interest of one of the stakeholders (shareholders wealth/profit).

2.2.3. Stewardship Theory

As earlier discussed, agency theory the management executives were depicted in the agency theory as agents who have interests divergent from those of their principals. The two parties are both utility maximizers. The agency theory assumes that utility motivations of agents and principals are individualistic leading to the divergence of principal-agent interests. However, this assumption is not necessarily true for all the managers and therefore exclusively relying on agency theory was considered undesirable (Davis, Schoorman, & Donaldson, 1997). It is this perceived shortcoming of agency theory that paved way for the formulation of stewardship theory.

The roots of stewardship theory can be traced to be in psychology and sociology. The theory was designed for researchers to investigate situations in which there is a motivation for executives as stewards to act in the way that best serves the interests of their principals. (Donaldson & Davis, 1989; 1991). In the stewardship theory, a man is modelled as a steward with behaviors ordered in such a manner that pro-organizational, collectivistic behaviors results to levels of utility higher than behaviors that of individualistic and serving self-interests. More

so, during exposure to the choice between self-serving and pro-organizational behaviors, the behavior of a steward will not deviate from his/her organization's behavior. Therefore, even in cases where there is no alignment of the interests of the stewards to those of the principal, the steward values cooperation more than defection since he/she is considered rational and places higher utility in cooperation (Davis et al., 1997).

The stewardship theory further postulates that stewards have collective behaviors because they seek to achieve the objects of the organization such as growth of sales or profitability. Consequently, principals will benefit from these behaviors as a result of positive effect of profit on dividends and prices of shares. The stewardship approach has been theorized to assume a solid relationship between the organization's success and satisfaction of principals (Davis et al., 1997). Through firm performance, a steward provides protection and maximization of the shareholders' wealth since doing so will also maximize his/her utility. Although a firm has various stakeholders with often diverging interests, it is argued a steward generally satisfies most groups if he/she manages to successfully improve the performance of an organization. This is so because increase in wealth of an organization serves the interests of most groups. Thus, a pro-organizational steward aspires to maximize the performance of an organization and thus satisfying the interests of shareholder.

The stewardship theory has noted that many stakeholders' interests are well served through wealth maximization. The study thus assumes that as stewards, financial executives ensure that WC is well managed with the interests of all stakeholders at heart. Examining the relationship between the stewards' decisions and the profitability of firms is the primary objective of this proposed study because financial managers (stewards) are assumed to maintain proper levels of accounts receivables, accounts payable and inventory in their pro-organization pursuit.

2.2.4. Baumol Model of Cash Management

The Baumol model is relied up on when determining the optimum cash balance a firm should hold when the prevailing conditions are certainty. The model makes an assumption that firms have the ability to predict with certainty their cash requirement and regularly receive some specified amount. In addition, it is assumed by the model that firms make cash payments uniformly over a period of time and that there is absolute certainty of the knowledge on the opportunity cost of holding cash instead of having it interest bearing securities (Baumol, 1952). Moreover, Baumol (1952) stated that financial executives in charge of cash invest excess funds in securities that earn interests and easily convert such securities into cash whenever the firm is in need of cash. When investment returns rises, financial managers increasingly invest in such securities because of the rise in the opportunity cost of holding cash. On the contrary, conversion of securities into cash attracts some transaction costs which when increased will increase cash balances held by financial managers. Thus, management of an optimal mix between cash and short term investment involves determining an optimum frequency for cash replenishment and the amount of securities that should be liquidated. This is ideally working capital management. In general, the Baumol model can be expressed as:

$$C^* = \sqrt{\frac{2cT}{K}} \quad (2.1)$$

Where

C^* is the optimum level of cash replenishment.

C is the annual cash demand

T is the trading cost per transaction

K is the rate of interest on marketable securities.

2.3 Determinants of Profitability in Oil and Gas Industry

Profitability of a firm is affected by various factors. Some of the key factors are: Working capital and working capital management, size of the firm, liquidity, leverage and growth rate. In this study, Size, leverage, growth rate and liquidity were used as control variables while various components of WCM were used as the independent variables.

2.3.1 Working Capital Management

Higher levels of working capital makes it easier for firms to meet their short term obligations. Firms that are able to meet their short term obligations will borrow less from external sources and this will mean less financing cost as well as reduction of charges related to late payment of debts. This in turn increases profitability of the firm. Samiloglu and Demirgunes (2008) maintained that efficiency in WCM has an effect on both the short-term financial performance (profitability) and long-term financial performance (maximization of the value of a firm). WCM can be measured using several methods including: CCC, DSO, DPO, DIO and Operating cycle (OC).

2.3.2. Size

Profits of firms are explained by absolute size. According to Vijayakumar and Kadirvelu (2003), the increase money capital of a firm increases its absolute profits as well as its earning power per unit of investment. This only holds if large firms are operating efficiently and are innovative. The positive effect of size on profitability is significant only to a certain point where profitability rises at a rate with proportional rise in size. This probably because other firms embrace the same strategies and also because of inefficiencies and diseconomies of scale due to the size being unmanageably large. In the contrary Wattanatorn and Kanchanapoom (2012) argues that the

relationship between profitability and size is generally negative. This controversy indicates that to this end, the direction of influence of size of a firm on its profit is still uncertain.

2.3.3. Growth Rate

Growth is critical to a firm. It is argued that growth is essential in the provision of finances for a firm to achieve its other objectives through expansion of profit growth which stimulates efficient management thus lowering capital output ratio and eventually resulting to higher profit rate (Vijayakumar & Kadirvelu, 2003). Generally, growth rate and profitability are positively related.

2.3.4. Leverage

High leverage level is associated with greater financial risk. Given that competition equalizes earnings, the higher return on net worth is attained as debt increases. Vijayakumar and Kadirvelu (2003) argues that firms have low debts since they operate in sectors characterized by high degree of business risks and therefore the relationship between leverage and profitability is expected to be negative.

2.3.5. Current Ratio

Working capital management involves decisions about size and composition of current assets and means of financing them. In making such decisions, firms have to tradeoff between solvency and profitability. In a comparison between two firms, a firm has better liquidity if it has higher current ratio. A high current assets to current liabilities ratio may signify floppy management practices since it may be a signal for poorly managed credits in regards to overextension of accounts receivables. On the other hand, a low current ratio is not also wished

for since this would lead to inadequate safety margin (Vijayakumar & Kadirvelu, 2003). It is therefore important that the ratio is maintained at an optimum level.

2.4 Empirical Literature

The link between working capital management and profitability of firms both in the oil and gas industry and beyond have been extensively explored by existing literature focusing both on the local market and beyond. This section reviews global studies before considering local ones with the review in both cases being ordered chronologically.

Vural et al. (2012) examined the relationship between components of WCM and how firms perform. The authors fitted into a panel data model secondary data from 2002 to 2009 obtained from 75 manufacturing firms listed on Istanbul Stock Exchange Market. The analytical results showed that gross operating profits as a measure for profitability of firms can be increased by reducing the time lag of accounts receivables and CCC. Furthermore, the study suggested that leverage as control variable negatively and significantly affect firms' profitability and value.

Pais and Gama, (2015) conducted a study that sought to provide empirical evidence on how WCM affects profitability of Portuguese small and medium enterprises (SMEs). The study used panel data across 6,063 Portuguese SMEs for the period 2002 to 2009. Data was analyzed using fixed effect, one of the panel data model and instrumental variables. The results indicated that a decline in level of inventories held as well a fall in the number of days taken by firms to settle their accounts payables (commercial liabilities) and time taken to collect payments from customers result to higher corporate profitability. In addition, the results showed that an increase in the value of variables that characterize working capital management such CCC was noted to have a declining effect on ROA.

In a separate study, Lyngstadaas and Berg (2016) investigated whether profitability of Norwegian SMEs is affected by WCM. The study relied on panel data where 84,300 observations were made between 2010 and 2013 from 21,075 Norwegian SMEs. Panel data regression using a combination of fixed effect and a two-stage least squares estimation revealed that higher levels of both current asset ratio and current liabilities ratio results are associated with higher profitability of firms. The probable reason for this was that profitable firms acquire more short-term funding so as to attain growth and require more current assets for sales facilitation.

Mbawuni et al. (2016) conducted a study to examine how working capital management impacts on the profitability of petroleum retail firms in Ghana during the 2008-2013 period. The authors used data from a sample of five petroleum retail firms in Ghana which was extracted from their audited annual reports. The study used regression analysis which was complemented by descriptive and correlation analysis. The findings indicated a favorable networking capital as well a favorable networking capital to total assets ratio among the investigated firms. Moreover, average days payable was noted as the major WCM component that drives profitability of firms as measured by ROA. In addition, the findings revealed insignificant relationship between the remaining WCM components i.e. CCC, average days inventory, and average days receivables.

Another study was conducted by Khalid et al. (2018) with the aim of finding out how WCM impacts ROA used as a proxy of profitability. The researchers relied on secondary data for the 2007-2012 period covering electrical equipment firms listed on Karachi stock exchange. Regression results revealed positive and significant impact of WCM on firms' profitability.

Oganga (2015) carried out a study to establish the relationship between WCM and profitability of small and medium enterprises (SMEs) in Nairobi County using a sample of 150 SMEs. Regression results showed that a number of SMEs within Nairobi County have not been able to

grow as a result of huge sums of funds usually being held up in varying components of WC which are poorly managed. More specifically, regression results showed that accounts receivable period, accounts payable period, inventory conversion period, CCC, and the number of years if jointly evaluated would rise the profitability of SMEs in Nairobi County.

In another study, Wanyonyi and Jagongo (2016) sought to investigate how WCM relates with profitability of firms in the energy and petroleum sector of Kenya. Primary data used was obtained using questionnaires from all the four firms in the energy and petroleum industry that had been listed in the NSE as at that time. Regression and correlation analysis results revealed a positive influence of inventory conversion period and average collection period on firms' profitability. The relationship was however noted to be negative for the case of average payment period. The study concluded that a relationship exist between WCM and financial performance of the firms investigated.

A study by Muya and Gathogo (2016) evaluated the effect of WCM on the profitability of manufacturing firms in Nakuru town, Kenya. The study adopted a descriptive research design which involved collection of primary data with the aid of questionnaires from 62 employees attached to different firms within the area of study. Descriptive and inferential statistics revealed that average payment period had a positive effect on profitability. However, the effect of CCC on profitability was noted to be negative. The study inferred that CCC is the most component of WCM. In general, the study concluded that WCM positively and significantly influences firms' profitability.

In their study, Kiptoo, Kariuki and Kimani (2017) sought to establish the effect of WCM practices on the financial performance of tea processing firms in Kenya. The study obtained primary cross-sectional data using questionnaires from a sample of 48 tea processing firms selected from a population of 54 tea processing firms in Kenya managed by Kenya Tea

Development Agency. Primary data was complimented by data obtained from relevant secondary sources. The correlation results suggested that inventory management has a negative and significant effect on the financial performance of tea processing firms. The study thus recommended that in order for firms in the tea processing sector to boost their returns, they should strive to minimize the total number of days taken before inventories are sold. Moreover, profitability was noted to increase with the duration the firms took settle their accounts payables.

2.5 Summary of the Literature Review

The relationship between working capital management and profitability of firms has been extensively studied. In general, existing literature (see for example Khalid et al., 2018; Muya & Gathogo, 2016) shows that working capital management has a positive effect on firms' performance as measured by profitability. Traditionally, most of these studies were based in economies outside Kenya, the recent past has recorded an increase of such studies in Kenya. These include: Kiptoo, Kariuki and Kimani (2012), Oganga (2015), Muya and Gathogo (2016) among others. However most of these studies have focused on other industries with little focus on oil and gas sector and even those that made this attempt narrowed their scopes to cover only firms listed in NSE. More so, some of these studies such as that by Wanyonyi and Jagongo (2016) considered the bigger picture of the energy and petroleum industry but the proposed study focus entirely on firms in the oil and gas industry. This study also extended to include firms in the oil and gas industry not listed in the NSE.

2.6 Conceptual Framework

This study focuses on the effect of working capital management on the profitability of firm in the oils and gas industry in Kenya. Thus the endogenous variable will be profitability of such firms. Profitability will be measured using ROE. Following closely the work of Sharma & Kumar (2011), Nazir and Afza (2009) and Samiloglu and Demirgunes (2008) among others,

postulates that profitability as measured by ROE depends on working capital management. Specifically, WCM is measured using various indicators namely: number of days sales outstanding (DSO), days inventory outstanding (DIO), days payables outstanding (DPO) and the cash conversion cycle (CCC) which measures the overall working capital management. In addition to the just mentioned exogenous variables, the study also includes some control variables which are growth of sales, leverage (ratio of total debt to total assets), current ratio and size of the firm. The relationship between the independent variables, dependent variable and control can thus be summarized as in Figure 2.1.

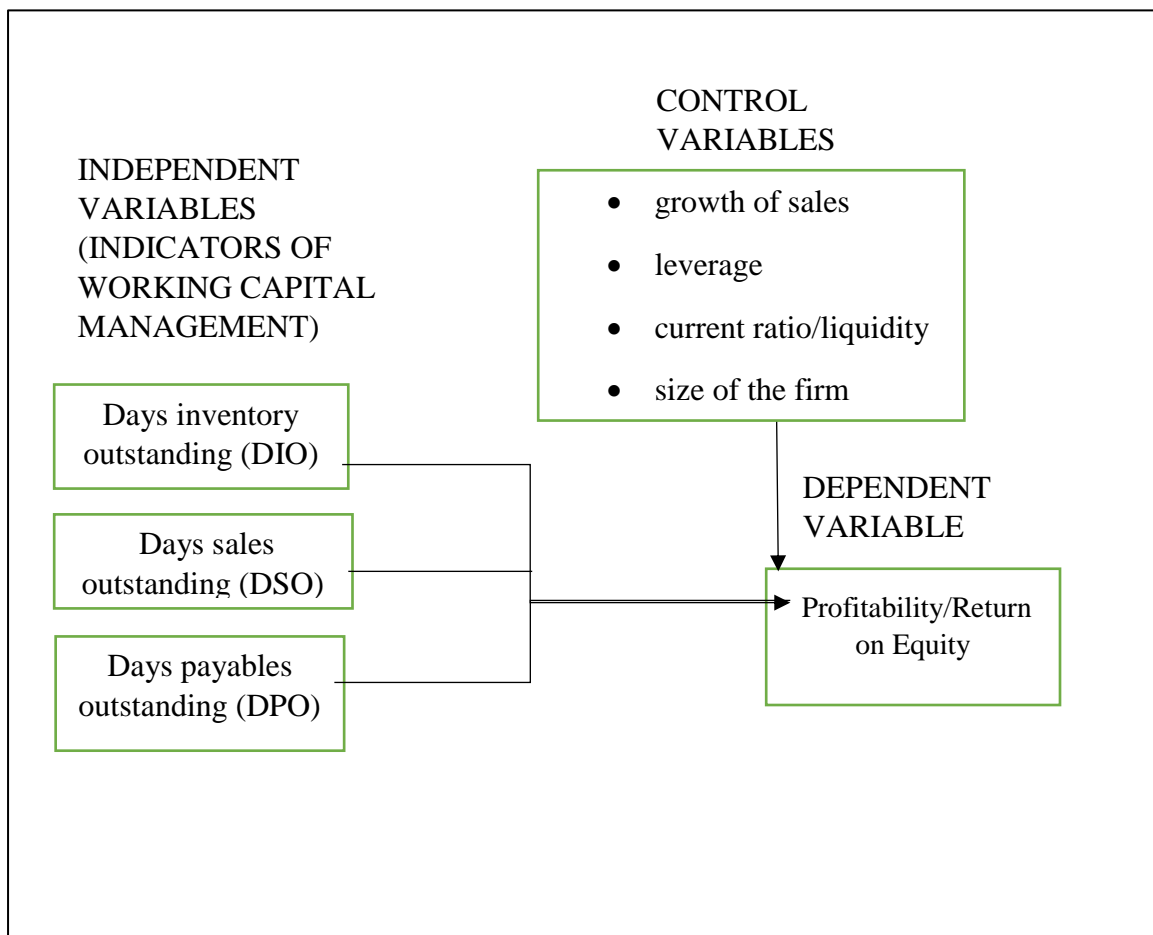


Table 1: Conceptual Framework
Source: Researcher (2018)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter focuses on the research methods that were employed by the study. The chapter covers a discussion on research design, population, sample and sampling techniques, data collection and data analysis.

3.2. Research Design

This study relied on non-experimental quantitative research design using secondary panel data. Non-experimental is preferred because in such a design, the researcher is unable to control manipulate or alter independent variable. Moreover, non-experimental design allows generalization to large population.

3.3. Population and Sampling Procedure

The entire oil and gas industry in Kenya constitutes of about 84 active oil marketing companies, out of which two are listed in the NSE. The study sample constituted 10 companies composed of 2 listed companies and 8 private companies.

3.4. Data Collection

To facilitate achievement of the study objective, secondary data was collected from appropriate annual published financial statements and any other relevant books of account of the firms within the oil and gas industry in Kenya for the period 2012-2017. In particular, data was collected on Net profit, accounts receivables and accounts payable, sales and purchases, inventory, current assets and current liabilities, total debt and total assets.

3.5. Data Analysis

The study used a quantitative approach. Correlation analysis and regression analysis, more specifically pooled ordinary least squares, was used to establish the effects of working capital management on profitability of firms in the oil industry in Kenya.

3.5.1 Diagnostic Tests

Normality test and homoscedasticity test were performed. The dependent and independent variables were subjected to shapiro wilk normality test in which the significance of their p value was investigated. The null hypothesis in this test is that the variable is normally distributed.

Homoscedasticity assumes the variables have same level of variability. If variances for the independent variables vary significantly then the profitability data would be considered heteroscedastic and may not be suitable for testing using this model. Likelihood ratio test (llr) was used to test for homoscedasticity of the error term. The null hypothesis in this test assumes that the variance of the error term is constant. Where the data passes both normality and homoscedasticity tests, then goodness of fit of the data is guaranteed and therefore the study would adopt the linear regression model suggested.

3.5.2 Model to Estimate

In the attempt to achieve its objective, this study borrows empirical modeling procedure as widely used by many researchers such as Sharma & Kumar (2011), Nazir and Afza (2009) and Samiloglu and Demirgunes (2008) among others. However, unlike in such studies where multiple panel models were specified with each capturing exclusively one independent variable at a time alongside the entire list of control variables, this study merges all the exogenous variables and then specifies a single panel data model expressed as:

$$ROE_{it} = \alpha_0 + \alpha_1 GROWTH_{it} + \alpha_2 LEV_{it} + \alpha_3 CR_{it} + \alpha_4 SIZE_{it} + \alpha_5 INV_{it} + \alpha_6 AR_{it} + \alpha_7 AP_{it} + \mu_{it} \quad (3.1)$$

Where:

ROE is the return on equity computed as: Net profit/Total equity

GROWTH computed as $(Sales_t - Sales_{t-1})/sales_{t-1}$ measure growth of sale.

LEV is the firm's leverage expressed as the ratio of total debt to total asset.

CR is the current ratio computed as *current assets (CA)/current liabilities (CL)*

Size measured by the natural logarithms of total assets

INV computed as $(average\ inventory/Cost\ of\ sales) \times 365$ represents the days of inventory. Also referred as days inventory outstanding (DIO).

AR calculated as $(average\ account\ receivable/credit\ sales) \times 365$ is the number of days accounts receivable. Also referred as days sales outstanding (DSO).

AP calculated as $(average\ account\ payable/purchases) \times 365$ is the number of days accounts payable. Also referred as days payables outstanding (DPO).

$\alpha_0, \alpha_1, \dots, \alpha_7$ Represent respective parameters to be estimated with α_0 being the intercept and $\alpha_1, \dots, \alpha_7$ are respective coefficients

μ is the error term

Finally, $i = 1, 2, \dots, n$ denote the cross-section dimension for the number of firms and

$t = 2012, 2013, \dots, 2017$, denote the time-series dimension for the period 2012-2017.

This study used ROE as a profitability measure. This choice is motivated by the fact that many studies have used ROA and therefore this study will use ROE and ascertain whether results are consistent with those of studies using ROA. It is also worthwhile noting that from the equations (3.1), the main independent variables of interest are INV, AR and AP i.e DIO, DSO and DPO respectively but growth, leverage, current ratio and size of the firm have been fitted into the model as control variables. Moreover, size of the firm is transformed into natural logarithms to reduce collinearity between the independent variables. Estimation of equations (3.1), will help the researcher in achieving the study objective specified in chapter one. This equation was estimated using pooled ordinary least squares method which was selected from the three panel data models namely: pooled ordinary least square (POLS), fixed effect (FE) and random effect (RE) models.

Choosing an appropriate panel data model involved two major diagnostic tests. First, Hausman test was conducted to decide whether the fixed effect or random effect is the best model. Hausman test involves testing non-zero correlation between unobserved effect and regressors, with the null hypothesis being that the two are not correlated. Ideally, this involves comparing an estimator which is consistent regardless of whether the null hypothesis is true or not with another estimator which is only consistent under the null hypothesis. Rejection of the null is an evidence against random effect while failure to reject the null is a signal to use the random effect on the grounds that the model is efficient. Secondly, a test on whether to choose POLS or random effect will be conducted using Breusch-pagan test. This test involves testing the null hypothesis of no unobserved effect. The rejection of the null implies that random effect is efficient as long as the unobserved individual effect (specific to each firm) is not correlated with the independent variable(s). Panel regression was also complimented by correlation analysis.

3.5.3. Test of Significance

The sign and magnitude of the parameters resulting from estimation of equation (3.1) was interpreted accordingly. A negative coefficient suggests that such an exogenous variable and profitability are inversely related. However, the inferential statistics (p-values and T-values) were interpreted to estimate the significance of the coefficient/importance of exogenous variable in explaining endogenous variable (ROA). On the other hand, F-statistics was used to determine the overall significance of the model i.e, joint significance of the parameters.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.0 Introduction

In this chapter an exhaustive analysis of the data obtained financial books of 10 companies in the oil sector is presented. A pooled OLS regression model was adopted. The adoption of this model was informed by both Hausman specification test and Breusch-Pagan Lagrange Multiplier test for random effects.

4.1 Descriptive Statistics

Descriptive statistics are important as a pointer to presence of outliers in the data. The descriptive statistics considered include the mean, standard deviation, minimum and maximum values for all the variables considered in the study. The study considered a total of 60 observations. The dependent variable is return on equities (ROE) while the independent variable working capital is captured by days sales outstanding (DSO), days inventory outstanding (DIO) and days payables outstanding (DPO). The control variables considered in the study include growth in sales, logarithm of total assets (logTA), current ratio and debt ratio. Table 2 presents the descriptive statistics.

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
ROE	60	-0.037	0.779	-5.490	1.497
CR	60	1.696	1.595	0.431	10.575
DSO	60	22.440	12.336	1.995	58.794
DPO	60	21.107	19.838	3.248	136.111
DIO	60	26.712	17.962	7.183	133.809
LogTA	60	7.0383	0.620	4.657	7.613
Growth	60	0.134	0.387	-0.549	1.870
DRatio	60	2.700	17.599	-16.071	134.296

Table 2: Descriptive statistics

Source: study data

The standard deviation illustrates how the sample mean deviates from the true mean. For instance, the results show that DSO deviates from its true mean by 12.336. From the results, it is evident that growth in sales has the least standard deviation while DPO has the largest deviation among the variables considered in the study. In addition, the mean, minimum and maximum makes it easy for one identify cases of multipliers. From the above results it can be concluded that there is no outlier in any of the variables used in the study.

4.2 Correlation Matrix

Table 3 presents Pearson product correlation. This test measures the linear association between variables. The study tested for linear relationship among the explanatory variables to check for presence of strong correlation which may lead to biased estimates.

	ROE	CR	DSO	DPO	DIO	LogTA	Growth	DERatio
ROE	1.00							
CR	0.25	1.000						
DSO	0.074	-0.422	1.000					
DPO	0.124	-0.198	-0.01	1.000				
DIO	0.1003	-0.035	-0.212	0.798	1.000			
LogTA	-0.109	-0.355	-0.002	0.212	0.186	1.000		
Growth	-0.009	0.0361	-0.331	-0.231	-0.344	-0.190	1.000	
DERatio	-0.951	-0.103	-0.111	-0.115	-0.064	0.0575	-0.0080	1.000

Table 3: Correlation matrix

Source: Study data

Variables are said to highly correlated if the coefficient of correlation is greater than positive or negative 0.75. The results in Table 4.2 shows that there exist a strong positive correlation between DPO and DIO. This high correlation could point to presence of multicollinearity. The remedy to multicollinearity will be the omission of one of the two variables from the model. The other correlation coefficients are less than positive or negative 0.5 implying weak association. The sign of the correlation coefficient points the direction of the relationship between the variables. For instance, there is a weak negative association between current ratio and days' sales outstanding. The association between days' payable order and logarithm of total

assets is positive but weak. The sign of correlation coefficient between dependent variable (ROE) and the explanatory variables may point to the nature of the relationship but do not clearly show the causation. The cause-effect relationship is revealed by regression.

4.3 Normality Test

The study tested for normality of the error term using shapiro wilk test. The results are illustrated in Table 4.

Variable	Obs	W	V	z	Prob>z
ROE	60	0.37009	34.240	7.616	0.00000
CR	60	0.50536	26.887	7.095	0.00000
DSO	60	0.96672	1.809	1.278	0.10065
CCC	60	0.98107	1.029	0.062	0.47534
DPO	60	0.66486	18.217	6.256	0.00000
DIO	60	0.67749	17.531	6.173	0.00000
LogTA	60	0.72539	14.927	5.827	0.00000
Growth	60	0.88248	6.388	3.997	0.00003
DERatio	60	0.18392	44.360	8.174	0.00000
Error term	60	0.28219	39.018	7.898	0.00000

Table 4: Normality Test

Source: Study data

The null hypothesis in shapiro wilk test states that the variable is normally distributed. From Table 4.3, it is evident that all variables except days' sales outstanding (DSO) and cash conversion cycle (CCC) are not normally distributed. Since the error term is found to be not normally distributed then it can be concluded that the data does not pass the test of normality. To correct this the study should use non-linear model but this is not possible for this study since some of the observations are negative. The theory however suggest that normality is not a serious problem in panel data.

4.4 Homoscedasticity Test

The assumption of homoscedastic error term is critical for valid hypothesis testing. To check this assumption, the study adopted likelihood ratio test (llr). The results are shown in Table 5

Likelihood-ratio test		LR chi2(22) =	-176.79
(Assumption: hetero in homosk) nested		Prob > chi2 =	1.0000

Table 5: Likelihood-ratio test for Homoscedasticity

Source: Study data

The null hypothesis of this test is that the error term is homoscedastic. From the results, it is evident that the error term is homoscedastic since the p value is highly insignificant leading to failure to reject the null hypothesis.

4.5 Hausman Specification Test

To identify the model that best fits the data, the study adopted performed the Hausman specification test (Hausman, 1978). For Hausman test to be carried out, results for fixed effects and random effects had to be obtained and stored. The Hausman specification test was then applied and the results are as shown in Table 6.

Test: Ho:difference in coefficients not systematic
$\text{chi2}(7) = (b-B)'[(V_b-V_B)^{-1}](b-B)$ $= 5.84$
Prob>chi2 = 0.4411

Table 6: Hausman Specification Test

Source: Study data

The null hypothesis in Hausman specification test is that random effects model is the best model to fit the data. From the results shown in Table 4.5 it's evident that the p value is highly insignificant implying that the null hypothesis should not be rejected. After settling on random effects model, a decision had to be made whether the final model that suits the data is random effects or pooled OLS. To get information on the best model between the two, Breusch-Pagan

Lagrange multiplier test proposed by Breusch and Pagan (1980) was adopted. The test results are shown in Table 7

chibar2(01)	0.00
Prob > chibar2	1.0000

Table 7: Breusch-Pagan Lagrange multiplier Test

Source: Study data

The null hypothesis in Breusch-Pagan Lagrange multiplier test states that pooled OLS is the best model to fit the data. The alternative hypothesis illustrates that random effects model is the most suitable. From the test results shown in Table 4.6, it is evident that the p- value is highly insignificant meaning we do not reject the null hypothesis.

4.6 Estimation results and Discussion

The study adopted pooled OLS regression as suggested by Breusch-Pagan Lagrange multiplier test. The results are shown in Table 8

Dependent variable (ROE)	Coefficient	T	P
CR	0.0945	4.24	0.000
DSO	0.00213	0.65	0.518
DPO	0.00324	1.77	0.077
DIO	0	(omitted)	
LogTA	0.00297	0.06	0.953
Growth	0.0545	0.60	0.551
DERatio	-0.0406	-24.83	0.000
Constant	-0.309	-0.75	0.454
R-sq: within = 0.9267			Prob > chi2 = 0.0000
between = 0.9736			
overall = 0.9346			

Table 8: Pooled OLS Regression Results

Source: Study data

4.6.1 Interpretation of the Results.

From Table 8, we obtain a fitted model shown in equation 4.1

$$ROE = -0.309 + 0.0945CR + 0.00213DSO + 0.00324DPO + 0.00297\log TA + 0.0545Growth - 0.0406DERatio \dots \dots \dots 4.1$$

The pooled OLS regression illustrates causation. Using t statistic and p value, on one hand, the coefficients of days' sales outstanding (DSO), logarithm of total assets (logTA) and growth in sales (growth) are found to be insignificant. On the other hand, the coefficients of current ratio (CR), days' payable outstanding (DPO) and debt ratio (DERatio) are statistically significant at 1%, 10% and 1% level of significance respectively. This means that current ratio, days' payable outstanding and debt ratio are important in influencing profitability of firms in the oil industry in Kenya.

Specifically, holding other factors constant, an increase in current ratio by one unit results to 0.0945 units increase in the firms' profitability as captured by ROE. With regards to days' payable outstanding, firms realize an increase in their profitability by 0.00323 units when the days' payable outstanding increase by a one unit if other factors are kept constant. Lastly, debt ratio is found to have a negative impact on Kenyan oil companies' profitability. The results reveal that an increase in debt ratio by one unit when all other factors are kept constant on average will reduce profits of the Kenyan oil companies by 0.0406 units.

The coefficients of days' sales outstanding, logarithm of total assets and growth in sales are positive but insignificant. This reveals that the variables are not important determinants of profitability among the oil companies in Kenya.

The results further reveals that the regression performed well in terms of overall significance. This is illustrated by a highly significant p value (Prob > chi2 = 0.0000). This implies the

explanatory variables considered in the study jointly influence profitability of oil companies in Kenya.

4.6.2 Discussion of the Findings

This study investigated the effect of working capital management to profitability oil companies in Kenya. The study adopted days' sales outstanding, days' payable outstanding, days' inventory outstanding as the components of working capital. Other control variables namely current ratio, total assets, growth of sales and debt ratio as informed by previous studies were considered.

The study found that days' payable outstanding is important determinant of profitability of oil companies in Kenya. This finding conforms to a study by Mbawuni, Mbawuni and Nimako (2016) which found that average days' payable as a major WCM component drives profitability of petroleum retail firms in Ghana. The study is also in line with that of Oganga (2015) which found accounts payable period to be important cause of rise of the profitability of SMEs in Nairobi County.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter presents a summary of the findings of the study and conclusions, policy recommendation based on the findings of the study, limitations of the study and recommendations for further studies.

5.2 Summary of Findings and Conclusions

Many studies have investigated the relationship between working capital management and profitability in various sectors. Majority of these studies have identified existence of a strong relationship between various components of working capital and firm profitability. Agha (2014) postulated that there is existence of a strong linear relationship between a firm's profitability and its working capital efficiency. Kenyan Oil and gas industry is a key sector of country's economy with petroleum accounting for nearly 30% of annual imports. WCM has been found to be an important factor in driving success of companies in the Oil and gas industry in Kenya. Wanyonyi and Jagongo (2016) established a positive relationship between WCM and financial performance (profitability) of energy and petroleum companies in Kenya.

In this study, the effects of various working capital components on firm profitability was studied using pooled OLS to analyse data collected from 10 OMCs for the years from 2012 to 2017. Days sales outstanding (DSO), Days Inventory outstanding (DIO) and Days Payables outstanding (DPO) were used to measure working capital efficiency. On average the companies in the study took 22 days to collect money from their debtors (DSO); stayed with inventory for 27days before selling (DIO) and paid their creditors after 21days (DPO).

DPO was found to positively and significantly influence profitability. Delaying payment to creditors by 1 day leads to a 0.324% increase in ROE. The findings concur with Maina (2013)

who investigated the relationship between working capital efficiency and financial performance for firms in the manufacturing sector listed in NSE using data for the period 2007 to 2011, he found positive relationship between DPO and ROE. Similarly, Mbawuni, Mbawuni and Nimako (2016) noted that average payables period is the major WCM component that influences profitability measured by using ROA.

However the study found that DSO and DIO as WCM components do not have a significant effect on profitability of firms in the Kenyan Oil and gas industry measured using ROE. This is similar to the findings of Mbawuni et al. (2016) who conducted a study to examine how WCM impacts profitability of petroleum companies in Ghana using a sample of 5 companies. The author noted that CCC, average days inventory, and average days receivables as WCM components do not have any significant impact on profitability.

On the other hand, liquidity measured using current ratio, was found to positively and significantly influence ROE with a unit increase in current ratio contributing to 9.45% increase in ROE. The results are in line with the findings of Lyngstadaas and Berg (2016) who investigated whether profitability of Norwegian SMEs is affected by WCM and found that higher levels of current asset ratio is associated with higher profitability of firms.

This study revealed that leverage measured using debt-equity ratio is an important determinant of profitability in the Oil and gas sector in Kenya portraying a strong negative relationship against ROE. A unit increase in debt-equity ratio contributed to 4% reduction in ROE. Using panel data model Vural et al. (2012) investigated 75 manufacturing firms listed on Istanbul Stock Exchange Market and found that increase in leverage level has the effect of reducing a firm's profitability and value. His findings are synonymous to the findings of this study.

All independent variables combined have a significant positive impact on profitability.

5.3 Policy Implications and Recommendations

Working capital management is an important consideration and has a bearing in profitability. According to this study, average payables period is the most important WCM component in determining profitability of a firm Kenyan Oil and gas sector. Managers should strive to increase the number of days they take to pay their key suppliers as this will positively influence the firm's profitability. However, this should be done in a way that does not spoil relationships with suppliers as this may lead to reputational risk and in turn can land the company in more serious problems such as shortages when the suppliers fail to supply product.

Oil industry in Kenya is highly regulated by the Ministry of Energy and Petroleum (MoEP). Imports of petroleum products into the country is done through the open tender system (OTS) in which OMCs are given only 5 days after discharge of product at Mombasa port to fully pay the importer. This is a short time given that on average the companies take 49 days to sell and collect money from the customers and therefore this leads to a gap in working capital forcing finance managers to go for debt financing. Going by the findings of this study the MoEP should consider extending the period within which OMCs are required to pay for fuel imports. This will shield most OMCs from strenuous working capital levels and consequently improve their profitability. This will see a reduction in number of companies that exit the Oil business annually in the country as this is mainly caused by working capital strains by such companies.

5.4 Limitations of the Study

Only 2 out of 84 companies in the Oil and Gas industry in Kenya are listed. This made it difficult to obtain data from private companies as such the study settled for only 10 companies. A bigger sample would have been preferable to give more reliable results.

Additionally, this study covered only 6years, 2012-2017 due to limitations of data availability.

DSO and DPO are calculated using credit sales and credit purchases respectively; however data on credit sales and purchases was not available therefore the study relied on total sales and total cost of sales i.e assumption was made that all sales and purchases are on credit.

It was noted that very few studies have been conducted specifically on the Oil sector in Kenya, many studies have focused on other sectors or a wider scope of sectors with Oil as one of them. As such there was scarcity of literature to make reference to for this study.

5.5 Areas for Further Study

This study considered only 10 companies in the Oil and gas industry which has 84 active participants. Additionally the study covered only 6years period, 2012-2017. Further studies should be conducted to get a bigger coverage of companies in this industry as well as a longer time span, this will give more pervasive results.

Further studies should be conducted in the context of oil and gas sector in Kenya. This will provide scholars with enough literature to refer for future research. Similarly, policy makers and finance managers in the oil sector will have additional research information to make better business decisions.

The findings of the study average days accounts receivable and average inventory days do not have a significant impact on profitability is inconsistent with other studies. Further studies should be conducted in the Oil industry to establish this relationship and possibly explain why these WCM components are not important determinants of profitability.

This study used total sales and total cost of sales to represent credit sales and credit purchases respectively. It is important that future studies identify credit sales and credit purchases as this will give a good representation of the working capital components i.e DSO, DIO and DPO.

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APPENDICES

Appendix I: Firms considered

Total Kenya Limited
KenolKobil Limited
Vivo Energy Kenya Limited
Oil Libya Limited
Hass Petroleum (K) Limited
Galana Oil (K) Limited
BlueSky Energy Limited
Trojan International Limited
Gapco Kenya Limited
National Oil Corporation of Kenya Limited