THE RELATIONSHIP BETWEEN WORKING CAPITAL MANAGEMENT AND FINANCIAL PERFORMANCE OF ENERGY AND PETROLEUM COMPANIES LISTED AT THE NAIROBI SECURITIES EXCHANGE

BY

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DECLARATION

This research project is my original work and has never been presented in any other university or College for an award of degree.

Signed…… Date……

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This research project has been submitted for examination with my approval as the university Supervisor.

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DEDICATION

This research project is dedicated to my dear parents Mr. and Mrs. Mugo for laying the strong foundation to my life. I am humbled to have you.

TABLE OF CONTENT

LIST OF TABLES

ABBREVIATIONS

ANOVA	-	Analysis of variance
ACP	-	Accounts Collection Period
APP	-	Accounts Payable Period
CCC	-	Cash Conversion Cycle
CMA	-	Capital Market Authority
CR	-	Current Ratio
DR	-	Debt Ratio
EOQ	-	Economic Order Quantity
ERC	-	Energy Regulatory Commission
GAAP	-	Generally Acceptable Accounting Principles
IFRS	-	International Financial Reporting Standards
ITID	-	Inventory Turnover in Days
JIT	-	Just In Time
KENGEN	-	Kenya Electricity Generating Company
KPLC	-	Kenya Power & Lighting Company.
NSE	-	Nairobi Securities Exchange
NTC	-	Net Trading Cycle
OLS	-	Ordinary Least Squares
PIEA	-	Petroleum Institute of East Africa
ROA	-	Return on Assets
ROS	-	Return on Sales
ROE	-	Return on Equity
WCM	-	Working Capital Management

ABSTRACT

The objective of the study was to establish the relationship between working capital management and financial performance of energy and petroleum firms listed at the Nairobi Securities Exchange in Kenya. The data analysis was carried on four energy and petroleum firms for a period of 10 years between 2003 and 2012. Secondary source of data was used in measuring both aspects of the variables which are working capital and financial performance of energy and petroleum firms. Data was analyzed using Statistical Packages for Social Sciences (SPSS) version 16. Regression and correlation analysis was used to determine the nature and strength of the relationship between independent and dependent variables. The relationship of average collection period, inventory conversion period and average payment period with return on equity was analyzed in this study. Based on the regression and correlation analysis of each of the companies, the findings indicate that the energy and petroleum firms' performance is influenced by the variables relating to working capital. There is a positive relationship between profitability and average collection period and inventory conversion period. Average payment period shows a negative relationship with profitability. Most of the profits in Energy and Petroleum firms in Kenya is attributable to working capital management. The study concludes that there exist a relationship between WCM and financial performance of Energy and Petroleum firms in Kenya. The study recommends that for the Energy and Petroleum firms to remain profitable, they should employ working capital management practice that will help in making decisions about investment mix and policy, matching investment to objective, asset allocation for institution and balancing risk against profitability.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Working capital is known as life giving force for any economic unit and its management is considered among the most important function of corporate management. Every organization whether, profit oriented or not, irrespective of size and nature of business, requires necessary amount of working capital. Working capital is the most crucial factor for maintaining liquidity, survival, solvency and profitability of business (Weinraub, 1998).

Working capital management is one of the most important areas while making the liquidity and profitability comparisons among firms (Eljelly, 2004) involving the decision of the amount and composition of current assets and the financing of these assets. The greater the relative proportion of liquid assets, the lesser the risk of running out of cash, all other things being equal. All individual components of working capital including cash, marketable securities, account receivables and inventory management play a vital role in the performance of any firm. Shin and Soenen, (1998) argued that efficient working capital management is very important to create value for the shareholders while (Smith, 1997) emphasized that profitability and liquidity are the salient goals of working capital management. The profitability liquidity tradeoff is important because if working capital management is not given due considerations then the firms are likely to fail and face bankruptcy (Kargar, 1994). The significance of working capital management efficiency is irrefutable (Filbeck, 2005).

A firm's value cannot be maximized in the long run unless it survives the short run. Firms fail most often because they are unable to meet their working capital needs; consequently, sound working capital management is a requisite for firm survival (Deloof, 2003). The crucial part in working capital financing is required in maintaining its liquidity in day-to-day operation to ensure its smooth running and meet its obligation (Eljelly, 2004). This is not a simple task since managers must ensure that business operation is running in efficient and profitable manner. There are possibilities of mismatch of current asset and current liability during this process. If this happens and firm's manager cannot manage it properly then it will affect firm's growth and profitability. This will further lead to financial distress and finally firms can go bankrupt.

Management of working capital aims at maintaining an optimal balance between each of the working capital components, that is, cash, receivables, inventory and payables is a fundamental part of the overall corporate strategy to create value and is an important source of competitive advantage in businesses (Deloof, 2003). In practice, it has become one of the most important issues in organizations with many financial executives struggling to identify the basic working capital drivers and the appropriate level of working capital to hold so as to minimize risk, effectively prepare for uncertainty and improve the overall performance of their businesses (Lieberman, 2009).

1.1.1 Working Capital Management

The term working capital refers to a firm's short-term assets or currents assets. Managing the firm's working capital is a day-to-day activity which ensures that the firm has sufficient resources to continue its operations. This involves a number of activities related to the firm's receipt and disbursement of cash (Lieberman, 2009). Most companies require certain levels of working capital to deal with variable and somewhat unpredictable financial inflows and outflows. Challenges such as disconnected supply chains processes, excessive stocks caused by non-bridged interfaces, inadequate trade credit terms, and suboptimal loan decisions require higher working capital than necessary. While the latter two originate from the financial area, connecting supply chain activities and reducing stock and inventory belong to the operating area. Companies tend to try to have less capital tied up in non-productive stocks, shorten the collection period for account receivables, and stretch cash payments for accounts payable as far as possible (Hofman, 2010).

The management of working capital plays an important role in maintaining the financial health of the company during the normal course of business. Short-term finance is an essential part of working capital management. Working capital is the only investment a company makes without expecting a defined return. The investment is needed in order to keep the business going rather than to produce something from itself. Because of this, many companies have over-invested in working capital leading to cash flow problems and to a decrease in shareholder value. For many businesses the components of working capital represent the largest items on the balance sheet. Despite this they tend not to be

seen as issues demanding strategic consideration or top management attention (Deloof, 2003).

Hofman, (2010) summarize that the management of working capital includes all aspects of the administration of current assets and liabilities. Working capital management aims to minimize the capital to be tied up in the company's turnover process by reducing current assets and extending current liabilities. Companies invest in short-term assets, which are inventories, accounts receivables, cash and short-term securities. Each of these need to be managed.

1.1.2 Financial Performance

Performance is the function of the ability of an organization to gain and manage the resources in several different ways to develop competitive advantage (Iswatia, 2007). There are two kinds of performance, financial performance and non-financial performance. Financial performance emphasizes on variables related directly to financial report. Financial performance is a subjective measure of how well a firm can use assets from its primary mode of business and generate revenues. The term is also used as a general measure of a firm's overall financial health over a given period of time and can be used to compare similar firms across the same industry or to compare industries or sectors in aggression.

Company performance is very essential to management as it is an outcome which has been achieved by an individual or a group of individuals in an organization related to its

authority and responsibility in achieving the goal legally, not against the law, and conforming to the morale and ethic. Company's performance is evaluated in three dimensions. The first dimension is company's productivity, or processing inputs into outputs efficiently. The second is profitability dimension, or the level of which company's earnings are bigger than its costs. The third dimension is market premium, or the level of which company's market value is exceeding its book value (Weinraub, 1998).

Performance is a difficult concept, in terms of both definition and measurement. It has been defined as the result of activity, and the appropriate measure selected to assess corporate performance is considered to depend on the type of organization to be evaluated, and the objectives to be achieved through that evaluation. Researchers in the strategic management field have offered a variety of models for analyzing financial performance. However, little consensus has emerged on what constitutes a valid set of performance criteria. For instance, researchers have suggested that studies on financial performance should include multiple criteria analysis. This multidimensional view of performance implies that different models or patterns of relationship between corporate performance and its determinants will emerge to demonstrate the various sets of relationships between dependent and independent variables in the estimated models (Ostroff, 1993).

1.1.3 Relationship between Working Capital and Financial Performance

Working capital is a vital element in any organizational setting that requires cogent attention, proper planning and management. As resources available to organizations are scarce, it is believed that the management of an organization's working capital has a pivotal role to play in the achievement of profitability and overall performance of an entity. This implies that a firm's liquidity does to a large extent determine its profitability. However, liquidity and profitability are not the same but, are the core objectives of a firm (Ganesan, 2007).

The traditional belief about working capital and profitability holds that reducing working capital investment would positively affect the profitability of firm (aggressive policy) by reducing proportion of current assets in total assets. Deloof (2003) analyzed a sample of Belgian firms, and Wang (2002) analyzed a sample of Japanese and Taiwanese firms, emphasized that the way the working capital is managed has a significant impact on the profitability of firms and increase in profitability by reducing number of day's accounts receivable and reducing inventories. A shorter Cash Conversion Cycle and net trade cycle is related to better performance of the firms. Furthermore, efficient working capital management is very important to create value for the shareholders.

Soenen (1998) analysed a sample of US firms also reported similar findings but he used Net Trading Cycle (NTC) as comprehensive measure of working capital management and found significant negative relationship between NTC and profitability. However,

divergent to traditional belief, more investment in working capital (conservative policy) might also increase profitability. When high inventory is maintained, it reduces the cost of interruptions in the production process, decrease in supply cost, protection against price fluctuation and loss of business due to scarcity of products (Blinder, 1991). Increase in company profitability by reducing the liquidity can bring some serious problems as goals cannot be ignored at any cost; if goal of maximizing the profit is ignored survival is not possible for a longer time and if liquidity objective is ignored, insolvency or bankruptcy could be faced (Eljelly, 2004).

The management of working capital involves managing inventories, accounts receivable and payable, and cash. Implementing an effective working capital management system is an excellent way for many companies to improve their earnings (Gitman, 1974). The two main aspects of WCM are ratio analysis and management of individual components of working capital. A few key performance ratios of a working capital management system are the working capital ratio, inventory turnover and the collection ratio. Ratio analysis will lead management to identify areas of focus such as inventory management, cash management, accounts receivable and payable management (Nimarathasan, 2010).

Many businesses developed strategies in response to the financial crisis that have become the new norms. The focus has been on strategically and efficiently managing a company's assets to contribute to its overall financial health. From a financial perspective, WCM studies have suggested effective WCM could be achieved by improving the cash conversion cycle to incorporate performance. As previously

mentioned, the notion of shortening the cash conversion cycle (similar to 'squeezing' WCM components) leads to positive liquidity (Richards, 1980) and improved profitability (Shin, 1998). The first study was conducted by Shin and Soenan (1998), who found a significant relationship between shortened cash cycles and an improvement in profitability among American companies.

1.1.4 Energy and Petroleum Firms Listed in Nairobi Securities Exchange

The oil companies in Kenya also referred to as Oil Marketing Companies in this study represent the firms that are involved in marketing and distribution of petroleum products in Kenya. They comprise of both the local and the multinational companies. The industry is mainly regulated by the Energy Regulatory Commission (ERC).

The oil industry in Kenya is characterized by above 75 oil marketers. It is governed by the Kenyan law which covers operations from crude importation, refining and retailing. It is an oligopolistic structure dominated by about 3 major players. The three players control over half of the market share with 54.9% of the total market share as at March 2014 (Total Kenya controlling 21.7%, Vivo Kenya 18.9% and KenolKobil 13.9%) according to PIEA (2014). The sector is very competitive characterized by price controls, common non-differentiable products and strict taxation structure within a liberalized economy therefore requiring adoption of other strategies besides price and its related derivatives as a competitive strategy. Amongst the strategies is use is working capital

management to have an edge over their competition and merger & acquisitions to attain economies of scale.

The Kenyan Energy and Petroleum sector is considered as one of the key segments of the economy. Petroleum fuel constitutes the main source of commercial energy in Kenya. Kenya is a net importer of petroleum products. Growth in the profits of the energy sector will depend upon identifying all the variables that can influence profit of a firm including the management of working capital. The inability of a firm to meet its obligations will lead to the disruption of its marketing and distribution process by actions such as labour strikes and blacklisting by suppliers. Key challenges facing the energy and petroleum sector includes high cost of operations which is ever increasing due to poor infrastructure, regulation, volatility in exchange rates, tax administration and burden of government. Other challenges include security issues with recent cases of terror attacks.

1.2 Research Problem

Company financial performance is very essential to management. A financially stable company attracts investors both locally and abroad. It is also very easy for a financially stable company to obtain loans for development hence its growth. Well-managed working capital is crucial to the running of a healthy and successful business. Good capital management ensures that the cash available to a business always exceeds its current liabilities, otherwise the business can risk getting into problems associated with having a working capital deficit. In the short term this can damage the profitability of the business, and affect its operations. In the long term, poor working capital management

can compromise a company's eligibility for business loans, and damage its ability to attract potential investors (Nimarathasan, 2010).

Decisions relating to working capital and short term financing are referred to as working capital management (WCM). WCM in energy and petroleum firms is vital if ensures a company has sufficient cash flow in order to meet its short-term debt obligations and operating expenses. These involve managing the relationship between a firm's short-term assets and its short-term liabilities. The goal of WCM is to ensure that the firm is able to continue its operations and that it has sufficient cash flow to satisfy both maturing short-term debt and upcoming operational expenses. The management of working capital involves managing inventories, accounts receivable and payable, and cash. Implementing an effective working capital management system is an excellent way for many companies to improve their earnings (Ganesan , 2007).

To test the relationship between working capital management and corporate profitability, Deloof (2003) used a sample of 1,009 large Belgian non-financial firms for a period of 1992- 1996. By using correlation and regression tests, he found significant negative relationship between gross operating income and the number of days accounts receivable, inventories, and accounts payable of Belgian firms. Based on the study results, he suggests that managers can increase corporate profitability by reducing the number of day's accounts receivable and inventories.

Can working capital management be ignored? Does it affect the smooth running of a firm? Rapidly expanding sales may cause intense pressure for inventory and receivable build-up, draining the cash resources of the firm. A large sales increase creates an expansion of current assets especially accounts receivable and inventory. (Raheman, 2007). The strategic importance of working capital management has ignited various researchers to focus on evaluating the working capital management and profitability relationships (Lieberman, 2009). The necessity to gauge the importance of working capital has led to the question; is there a relationship between working capital management and the financial performance of energy and petroleum companies listed in Nairobi securities exchange.

1.3 Research Objectives

The objectives of this study are to establish:

i) The working capital management practices of energy and petroleum firms listed in Nairobi Securities Exchange.

ii) The relationship between working capital management and financial performance of energy and petroleum firms listed in Nairobi Securities Exchange.

1.4 Value of the Study

The study findings will benefit management and staff of oil marketing companies under study to gain insight into how their companies can effectively manage their working capital to enhance their financial performance. The management will employ the best

policies for managing working capital. The research will provide valuable information regarding the energy and petroleum sector.

Scholars and academicians will be furnished with relevant information regarding working capital management. The research will contribute to the general body of knowledge and form a basis for further research. The Petroleum Institute of East Africa would also use the findings to enhance its curriculum. Regulatory bodies like Energy Regulation commission and the Ministry of Energy can use the findings to improve on the framework for regulator of oil marketers in Kenya. Policy makers will also be able to formulate and implement new set of policies regarding the working capital management in the oil industry.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews the literature that forms the basis of the study. It will highlight theoretical framework where theories/hypothesis and model relating to the study are discussed. Also in the chapter a review of Empirical literature where past studies by various scholars locally and globally on working capital management/performance are discussed. Lastly a summary of literature review wraps up the chapter by highlighting the gap in the literature that the present study seeks to bridge.

2.2 Theoretical Review

The WCM theory is based on the traditional models of Cash Conversion Cycle (CCC). Cash conversion cycle indicates how best a corporation is organizing its working capital (Nobanee, 2011). CCC is the most important aspect in WCM. Working capital management techniques utilized by business managers aids them in effectively managing working capital. Techniques such as intersection of carrying costs and shortage cost, working capital financing policy, cash budgeting, EOQ and JIT are applied to manage different components of working capital like cash, inventories, debtors and account payables.

2.2.1 Baumol Model of Cash Management

Baumol model of cash management helps in determining a firm optimum cash balance under certainty. It is extensively used and highly useful for the purpose of cash management. The Baumol model is based on the Economic Order Quantity (EOQ). The objective is to determine the optimal target cash balance. Baumol made the following assumptions in his model; the firm is able to forecast its cash requirement with certainty and receive a specific amount of regular intervals; the firm's cash payments occur uniformly over a period of time that is; a steady rate of cash outflows; the opportunity cost of holding cash is known and does not change over time; cash holdings incur an opportunity cost in the form of opportunity foregone; the firm will incur the same transaction cost whenever it converts securities to cash; cash transactions incurs at a fixed and variable cost.

The limitation of the Baumol model are as follows; assumes a constant disbursement rate; in reality cash outflows occur at different times, different due dates; assumes no cash is coming in and out on a frequent basis; no safety stock is allowed for reason being it only takes a short amount of time to sell marketable securities (Baumol, 1952).

The Baumol model assumes the cash manager invests excess funds in interest bearing securities and liquidates them to meet the firm's demand for cash. As investment returns increase, the opportunity cost of holding cash increases and the cash manager decreases cash balances (Baumol, 1952). As transaction costs (cost of liquidating short-term investments) increase, the cash manager decreases the number of times he liquidates

securities, leading to higher cash balances. Managing the cash - short-term investments mix involves determining the optimal frequency for replenishing cash and the amount of securities to liquidate.

2.2.2 Transaction Cost Economics Theory

The optimum level of inventory should be determined on the basis of a trade-off between costs and benefits associated with the levels of inventory. Costs of holding inventory include ordering and carrying costs. Ordering costs is associated with acquisition of inventory which includes costs of preparing a purchase order or requisition form, receiving, inspecting, and recording the goods received. However, carrying costs are involved in maintaining or carrying inventory and will arise due to the storing of inventory and opportunity costs. There are several motives for lower or higher levels of inventories and highly depends on what business a company is in. The most widely and simple motive of managing inventories is the cost motive, which is often based on the Transaction Cost Economics (TCE) theory (Marques, 2011). To be competitive, companies have to decrease their costs and this can be accomplished by keeping the costs of stocking inventory to a reasonable minimum. This practice is also highly valued by stock market analysts.

2.2.3 Miller and Orr's Cash Management Model

Miller and Orr (1966) came up with another model of cash management. As per the Miller and Orr model of cash management the companies let their cash balances move within two limits, upper and lower limit. The companies buy and sell marketable

securities only if the cash balance is on the lower or upper limit. The model rectifies some of the deficiencies of the Baumol model by accommodating a fluctuating cash flow situation stream that can either be inflow or outflow.

The importance of Miller-Orr Model is that it provides a formula for determining the optimum cash balance (Z), the point at which to sell securities to raise cash (lower limit L) and when to invest excess cash by buying securities and lowering cash holdings (upper limit H).

2.2.4 Operating Cycle Theory

Liquidity management can be achieved by undertaking the balance sheet and income statement analysis. In particular, incorporating accounts receivable and inventory turnover measures into an operating cycle concept provides a more appropriate view of liquidity management than does reliance on the current and acid-test ratio indicators of solvency. These additional liquidity measures explicitly recognize that the life expectancies of some working capital components depend upon the extent to which three basic activities- production, distribution (sales), and collection - are non-instantaneous and un-synchronized (Weston, 1979).

Accounts receivable turnover is an indicator of the frequency with which a firm's average receivables investment is converted into cash. Changes in credit and collection policy have a direct impact on the average outstanding accounts receivable balance maintained relative to a firm's annual sales. Granting more liberal terms to a firm's

customers creates a larger, and potentially less liquid, current investment in receivables. Unless sales increase at least proportionately to the increase in receivables, this potential deterioration in liquidity will be reflected in a lower receivables turnover and a more extended receivables collection period. Decisions that commit a firm to maintaining larger average receivables investments over a longer time period will inevitably result in higher current and acid-test ratios (Richards, 1980).

Inventory turnovers depict the frequency with which firms convert their cumulative stock of raw material, work-in-process, and finished goods into product sales. Adopting purchasing, production scheduling, and distribution strategies that require more extensive inventory commitments per dollar of anticipated sales produces a lower turnover ratio. This, in turn, reflects a longer and potentially less liquid inventory holding period. If firms cannot modify either the payment practices established with trade creditors or their access to short-term debt financing provided by non-trade creditors, decisions that create longer or less liquid holding periods will again be accompanied by a higher current ratio indicator of solvency (Weston, 1979).

The cumulative days per turnover for accounts receivable and inventory investments approximates the length of a firm's operating cycle. Incorporating these asset turnovers into an operating cycle concept of the current asset conversion period thereby provides a more realistic, although incomplete, indicator of a firm's liquidity position. The operating cycle concept is deficient as a cash flow measure in that it fails to consider the liquidity requirements imposed on a firm by the time dimension of its current liability

commitments. Integrating the time pattern of cash outflow requirements imposed by a firm's current liabilities is as important for liquidity analysis as evaluating the associated time pattern of cash inflows generated by the transformation of its current asset investments (Richards, 1980).

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time pattern of cash inflows generated by the transformation of its current asset investments (Richards, 1980).

2.3 Determinants of Profitability in Energy and Petroleum Firms

Performance is the function of the ability of an organization to gain and manage the resources in several different ways to develop competitive advantage. There are two kinds of performance, financial performance and non-financial performance (Deloof, 2003). There have been various measures of financial performance. For example return on sales reveals how much a company earns in relation to its sales, return on assets determines an organization's ability to make use of its assets and return on equity reveals what return investors take for their investments (Demirgunes, 2008).

The financial and non-financial factors, such as leverage, liquidity, size, age, and management competence index have an influence on the firms' financial performance and growth. Debt leverage is measured by the ratio of total debt to equity (debt/equity ratio). It shows the degree to which a business is utilizing borrowed money. Companies that are highly leveraged may be at risk of bankruptcy if they are unable to make payments on their debt; they may also be unable to find new lenders in the future. Leverage is not always bad, however; it can increase the shareholders' return on their investment and make good use of the tax advantages associated with borrowing (Rafuse, 1996).

The size of the firm affects its financial performance in many ways. Large firms can exploit economies of scale and scope and thus being more efficient compared to small firms. In addition, small firms may have less power than large firms; hence they may find it difficult to compete with the large firms particularly in highly competitive markets. On the other hand, as firms become larger, they might suffer from inefficiencies, leading to inferior financial performance (Khamrui, 2012).

2.4 Empirical Studies

Ghosh (2003) examined the efficiency of working capital management of Indian cement companies during 1992 - 93 to 2001 - 2002. He calculated three index values - performance index, utilization index, and overall efficiency index to measure the efficiency of working capital management, instead of using some common working capital management ratios. By using regression analysis and industry norms as a target efficiency level of individual firms, Ghosh tested the speed of achieving that target level of efficiency by individual firms during the period of study and found that some of the sample firms successfully improved efficiency during these years.

Shin (1998) researched on the relationship between working capital management and value creation for shareholders. The standard measure for working capital management is the cash conversion cycle (CCC). Cash conversion period reflects the time span between disbursement and collection of cash. It is measured by estimating the inventory conversion period and the receivable conversion period, less the payables conversion period. In their study, Shin and Soenen used net-trade cycle (NTC) as a measure of

working capital management. NTC is basically equal to the cash conversion cycle (CCC) where all three components are expressed as a percentage of sales. NTC may be a proxy for additional working capital needs as a function of the projected sales growth

Peel, (1996) examined the relationship between working capital management and profitability of companies by using correlation and regression analysis, and working capital intensity. Using a sample of 58,985 firm years covering the period 1975-1994, they found a strong negative relationship between the length of the firm's net-trade cycle and its profitability. Based on the findings, they suggest that one possible way to create shareholder value is to reduce firm's NTC.

Novazz (2011) conducted a study to find out the relationship between working capital management and profitability in Brazilian-listed companies. The objectives of their study were to investigate if there was any difference between corporate profitability and working capital management in two separate groups of companies: working capital intensive and fixed capital intensive; and to identify the variables that most affect profitability. They have measured profitability in three different ways: Return on Sales (ROS), Return on Assets (ROA) and ROE. The independent variables used are cash conversion efficiency, debt ratio, days of working capital, days' receivable and days of inventory. Multiple linear regression used in their study identified that, there exists negative relationship between CCC (equal to days of working capital), debt ratio and profitability.

To determine the effect of working capital management on the net operating profitability and liquidity, Raheman selected a sample of 94 Pakistani firms listed on Karachi Stock Exchange for a period of 6 years. Average collection period, inventory turnover in days, average payment period, CCC, current ratio, debt ratio, size of the firm, and financial assets to total assets ratio are the selected independent variables and net operating profit is the dependent variable used in their analysis. They found that there is a strong negative relationship between variables of working capital management and profitability of the firms. Their study also demonstrates a considerable negative relationship between liquidity and profitability, and that a positive relationship exists between size of the firm and its profitability. Furthermore, there is a significant negative relationship between debt used by the firm and its profitability (Raheman, 2007)

Deloof (2003) investigated the relationship between working capital management and profitability for a sample of 1009 Belgian Companies for the period of 1960-1992. In this study have been used cash conversion cycle inventories and number of day's accounts receivable as indicators of trade credit and cash conversion cycle as comprehensive indicator of working capital management. The results show that manager can increase profitability of trade by reducing the number of accounts receivable, inventories and also by reducing cash conversion cycle.

Maina (2013) investigated the relationship between working capital management and financial performance for manufacturing firms listed in Nairobi Securities Exchange. He analyzed data by applying both descriptive and inferential statistics for the time period

of 2007 to 2011. It was found that inventory turnover in days has negative relationship with Return on Equity which means that companies financial performance can be increased by reducing inventory in days. APP is found to be significant positive association with Return on Equities, indicating that if time period of supplier‘s payment is increased then overall firm‘s financial performance also improves. Cash Conversion period and Net payment period shows significant negative relation with Return on Equities showing that firms' financial performance can be increased with short size of both of them. Lastly liquidity (Current Ratio) is positively associated with ROE.

Waithaka (2012) investigated the relationship between working capital management and financial performance of agricultural firms listed in NSE. The population comprised of 7 listed agricultural companies in Kenya as at December 2011 and all of them formed the sample size. Secondary data from the financial statements of the firms was used in conducting the study. The study discovered that the management of agricultural companies in Kenya can create value for their shareholders by reducing the number of days of accounts receivables. The management can also create value for their shareholders by increasing their inventories to a reasonable level. Firms can also take long to pay their creditors in as much as they don't strain their relationships with their creditors. The study also found out that firms are capable of gaining sustainable competitive advantage by means of effective and efficient utilization of resources of the organization through a careful reduction of the cash conversion cycle. In so doing, the profitability of firms is expected to increase.

Runyora (2012) collected data for this study from the listed firms on the NSE for the period 2003-2012. The study covered a period between 2003 and 2012 in order to ensure accuracy of the collected data. Observations of items from the balance sheet and profit and loss accounts showing signs contrary to reasonable expectations were removed. Thus a balanced panel dataset of 100 firm year observation was obtained, with observation of 10 firms between 2003 and 2012. In order to analyze the effects of working capital components on the profitability of manufacturing and construction companies in Kenya, profitability is measured by Return on Assets (ROA), which is defined as the ratio of earnings before interest and tax to total assets. ROA is used as a dependent variable.

Most of the Kenyan manufacturing firms have large amounts of cash invested in working capital. It can therefore be expected that the way in which working capital is managed will have a significant impact on profitability of those firms. Makori carried out a study and found out existence of negative correlation between Return on Assets and the firms average collection period and cash conversion cycle. However, the study findings suggests that there is a positive correlation between Return on Inventory Holding Period, Accounts Payment Period and. These results suggest that managers can create value for their shareholders by reducing the number of day's accounts receivable and increasing the accounts payment period and inventories to a reasonable maximum.

2.5 Summary of Literature Review

Three models have been considered in this study i.e Baumoul model, Miller & Orr's model and operating cycle theory. The objective of the theories is to determine the optimal target cash balance for a good working capital Management. The three theories rely on the trade-off between the liquidity provided by holding money and the interest forgone by holding one's assets in the form of non-interest bearing money.

From a scan of the above studies it has been found that the term profitability was measured in different ways by the authors. It was measured in terms of ROS, ROA, ROE, gross operating income, gross operating profit and net operating profit. But, all the above authors found negative relationship between CCC and profitability. Also, the authors established negative relationship between debt used by the firm and profitability.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the research methods that the researcher used to facilitate execution of the study to satisfy study objectives. The steps included; research design, population of interest, sample and sampling techniques, data collection instruments, procedures and data analysis.

3.2 Research Design

Research design is the plan and structure of investigation so conceived as to obtain answers to research questions. The main purpose of this research was to determine the relationship between working capital management and financial performance of Energy and Petroleum firms in Kenya. Therefore a descriptive research was used to study whether this relationship exists between working capital management and financial performance of Energy and Petroleum firms listed in the NSE.

The research used both descriptive and quantitative research design. The major purpose of descriptive research was to provide information on characteristics of a population or phenomenon. Descriptive research will be used as a pre-cursor to quantitative research designs as it provides the general overview giving some valuable pointers as to what variables are worth testing quantitatively.

3.3 Population

A population is an entire group of individuals, events or objects having common characteristics that conform to a given specification. The population of interest in this study constitutes all energy and petroleum companies quoted at the NSE (Kenol Kobil, Total, KPLC & KenGen) for the period of ten years from 2003 to 2012. The study was limited to listed companies due to lack of readily available data from private companies not listed in NSE.

3.4 Data Collection

Data collection is gathering empirical evidence in order to gain insights about a situation and answer questions that prompt undertaking of the research. The study used secondary data collection methods which will be obtained from financial statements which include latest published annual reports, profit after tax, current assets, current liabilities, fixed assets and long term debt and equity to be surveyed. Company‘s financial statements were obtained from NSE library and the CMA library and website.

3.5 Data Analysis

Data analysis starts after data collection and ends at the point of interpretation and processing data is data analysis. The quantitative research approach was employed to arrive at the findings of the study. Correlation and regression analysis was used in the study to identify the nature and extent of relationship between working capital management variables and financial performance.

3.6 Analytical Model

Consistent with previous studies (Nazir, 2009; Zariyawati, 2008 & Samiloglu, 2008) the firm's profitability is modelled as a function of the four core working capital management measures in addition to other firm characteristics. The effects of working capital management on the firm's profitability are modelled adapted by Maina (2013) using the following OLS regression equations to obtain the estimates:

ROE = f (ACP, ITID, APP, DR, CR,)

$$ROEit = \beta_0 + \beta_1 ACPit + \beta_2 ITIDit + \beta_3 APPit + \beta_4 CRit + \beta_5 DRit + \varepsilon$$

Where:

ROE	Return of equity (ROE) to measure corporate financial performance Return on equity (ROE) ratio indicates the profitability of the company. ROE measures the rate of return on common stockholder's investment. ROE= Net Income/ Common Equity ROE it : Return on Equity of firm i at time t (i = 1, 2… 4 firms,).
β_0, 1….5	Constants representing the direction and extent to which each variable influences performance of a firm
ACP	The average collection period
ACP	is the approximate amount of time that it takes for a business to receive payments owed, in terms of receivables, from its customers and clients. *Accounts Receivable / Net Sales*365*
ITID	Inventory turnover period

It is an asset utilization ratio that indicates how long goods remain in inventory or unsold. The average inventory period ratio is measured by;

*Inventory / Cost of Goods Sold*365*

APP The average payment period

APP is a short-term liquidity measure used to quantify the rate at which a company pays off its suppliers.

A*ccounts Payable / Purchases*365*

CR Current ratio

Current ratio is a liquidity ratio that measures a company's ability to pay short-term obligations. It is calculated as shown below;

Current Assets / Current Liabilities

DR Debt ratio

Debt ratio is a financial ratio that measures the extent of a company's leverage. The debt ratio is defined as the ratio of total debt to total assets, expressed in percentage, and can be interpreted as the proportion of a company's assets that are financed by debt.

$$Debt\ Ratio = \frac{Total\ Debt}{Total\ Assets}$$

$\boldsymbol{\varepsilon}$ The error term that is a surrogate for all other variables influencing performance

Xit The different independent variables of firm _i' at time_t'.

T Time = 1, 2… 10 years

A correlation analysis was carried out to analyze the relationship between working capital management and firm‘s financial performance. Test of significance was carried out for all variables using t-test at a 95% level of significance. To examine the relationship among these variables, Pearson correlation coefficients were calculated. The study was limited to listed companies due to lack of readily available data from private companies not listed in NSE.

CHAPTER FOUR

DATA ANALYSIS, RESULT AND DISCUSSION

4.1 Introduction

This chapter covers data analysis, results and discussions. The data is summarized and presented in table form. The research design adopted was cross-sectional study in which data was gathered over the period 2003 to 2012. The study was carried out through the use of secondary data as detailed in oil industry in Kenya annual reports. The researcher obtained the data from the financial statements in their annual report. The population of the research consisted of four energy and petroleum firms listed in Nairobi stock exchange for a period of 10 years. The data collected was analysed by use of Statistical Package for Social Sciences (SPSS). Regression analysis was used to determine the relationship between working capital management and financial performance.

4.2 Descriptive Analysis

Table 4.1 Descriptive Analysis

	Minimum	Maximum	Mean	Median	Std. Deviation	Variance
Return On Equity (%)	3	90	13.22	10.715	13.81	19
ACP (days)	14.98	159.05	51.754	31.420	41.823	1.749
ITID (days)	16.38	137.57	52.953	38.985	37.695	1.421
APP (days)	17.19	174.42	81.652	76.936	54.298	2.948
Current Ratio	.81	1.80	1.335	1.303	.249	.062
Debt Ratio	.48	2.98	1.297	1.047	.679	.462

Table 4.1 above shows that the average return on equity for the 40 observations made from four companies for the years 2003-2012 is 13.22% a high standard deviation of 13.82% with minimum at 3% and maximum at 90% and a median of 10.7%. The average collection period is 51 days a standard deviation of 41 days with a minimum of 15 days and a maximum of 159 days the mean is 31days, the average inventory turnover period is 52 days with a standard deviation of 37 days, a minimum of 16 days and a maximum of 137 days, average payment period is period is 81 days with a standard deviation of 54 days. Similarly the current ratio and debt ratio is 1.33 and 1.29 with a standard deviation of 24% and 67% respectively.

4.3 Correlation Analysis

Table 4.2 Correlations

Correlations

		Return on Equity	Collection Period	Inventory Turnover	Payable Period	Current Ratio	Debt Ratio
Pearson Correlation	Return on Equity	1.000					
	Collection Period	.160	1.000				
	Inventory Turnover	.085	.954	1.000			
	Payable Period	-.107	.690	.717	1.000		
	Current Ratio	-.232	-.557	-.533	-.288	1.000	
	Debt Ratio	.012	-.177	-.155	-.507	-.143	1.000

Table 4.3 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.423[a]	.179	.058	.13411

R^2 is called the coefficient of determination and tells us how the financial performance of energy and petroleum firms in Kenya varied with working capital management. From table below, the value of R2 is .179. This implies that up to 17.9% of variations in profitability of the sector is influenced by changes in working capital management. 82.1% of variations in financial performance are due to other factors. The coefficient of correlation (R = 0.423). The coefficient of correlation shows that there was a weak relationship between the y and x variables.

Table 4.4 ANOVA

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.133	5	.027	1.482	.221[a]
	Residual	.611	34	.018		
	Total	.745	39			

a. Predictors: (Constant), Debt Ratio, Current Ratio, Inventory Turnover, Payable Period, Collection Period

b. Dependent Variable: Return on Equity

4.4 Regression Analysis

Table 4.5 Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.391	.194		2.013	.052
	Collection Period	.002	.002	.734	1.375	.178
	Inventory Turnover	-.002	.002	-.419	-.757	.454
	Payable Period	-.001	.001	-.471	-1.725	.094
	Current Ratio	-.116	.109	-.209	-1.069	.293
	Debt Ratio	-.039	.041	-.192	-.962	.343

ROE = 0.391 + 0.002ACP - 0.002ITID - 0.116 CR - 0.001 APP - 0.039 DR

From the above equation the study found that holding Average Collection Period, Inventory Turnover in Days', Average Payment Period, Cash Conversion Cycle and Debt Ratio to a constant zero net operating profit would be equal to 0.391. A unit increase in Current Ratio lead to increase in profitability by a factor of 0.116, a unit increase Average Collection Period would lead to a decrease in profitability by a factor of 0.002, a unit increase in Inventory Turnover in Days' will lead to an increase in profitability by a factor of 0.002, a unit increase in Average Payment Period leads to increase in profitability by factors of 0.001, further unit increase in debt ratio leads to increase in profitability by factors of 0.039.

4.5 Discussion of Research Findings

Anand (2001) asserted that an individual company's investment in working capital will be related to the type of industry it operates in and the essential working capital policy each individual company adopts. Working capital investment decisions concerns how

much of the firms limited resources should be invested in working capital. Financing decisions relate to how investment in working capital is to be invested. What may be considered as an optimal level in one company may differ from another company due to difference in operations or business characteristics across industries. Working capital requirements are also likely to change over time in response to changes in company's operation. Companies can adopt any of these three distinct working capital policies; an aggressive policy, moderate policy and a conservative policy.

A conservative policy implies relative high investment in current assets in relation to sales, the current assets to sales ratio will be comparatively high and assets turnover ratio will be low. In a conservative approach stock and cash levels will generally be kept high to avoid stock out and illiquidity costs. There is also likely to be a sizeable investment in short-term bank deposits and other short-term liquid investments. Gitman (1997) contributed that an aggressive policy relies on minimum investment in current assets and is highly dependent on access to short-term financing. He stated that with an aggressive policy, total investment in current assets will be kept to a minimum. The current asset to sales ratio will be much lower and the current assets turnover ratio much higher in comparison to a conservative policy. Gitman (1997) stated that a moderate or balanced capital falls midway between the aggressive and conservative policies. With a moderate policy, the level of investment in the current assets is neither lean nor excessive.

The study concludes that there exists a weak negative relationship between components of working capital and financial performance though the results were insignificant at 5%

Level. The model is not significant, since all the variables in the model are not significant as shown in the coefficient table 4.5. Other factors e.g. the size of the firm, management of the firm, level of competition and cost of production could better explain the financial performance of the energy and petroleum sector. The impact of foreign exchange volatility is also an important factor in determining the financial performance of energy and petroleum industry since Kenya is a major importer of petroleum products. Kithii (2008) did a study on relationship between working capital management and profitability of listed companies in the Nairobi Stock Exchange and established that working capital management greatly affect their profitability with those having good practices performing better than others.

The impact of working capital on a firm's performance has been done by various scholars. Overly it can be deduced that there exist a significant relation between performance and working capital management by using different variable selection for analysis. Narware (2004) in his empirical study on Indian National Fertilizer Limited, for 1990-91 to 1999-2000 signify that working capital management and profitability of the company disclosed both negative and positive association. He found evidence that increase in the profitability of a company was less than the proportion to decrease in working capital. However, the study done by Raheman & Nasr (2007) on a sample of 94 Pakistani firms listed on Karachi Stock Exchange for a period of 6 years from 1999 – 2004, demonstrate a strong negative relationship exists between variables of the working capital management represented by liquidity and debt with profitability of the firm**.**

Ganesan (2007) analyzed the working capital management efficiency of firms from telecommunication equipment industry. The variables used to represent the working capital were days sales outstanding, days inventory outstanding, days payable outstanding, days working capital, and current ratio while profitability and liquidity represent by cash conversion efficiency, income to total assets and income to sales. This study found evidence that even though days working capital is negatively related to the profitability, it is not significantly impacting the profitability of firms in telecommunication equipment industry. However, this was contrary to the results of Chowdhury (2007) who had found positive correlations between WCM with financial performance of the Pharmaceutical industry in Bangladesh.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter covers the summary of findings, conclusion recommendations, limitations and finally suggestion for further research.

5.2 Summary of Findings

The coefficient on the inventory conversion period is negative. This means that there exists a negative relationship between ITID and ROE. This finding is consistent with studies carried out on conservative working capital policies. This means that maintaining high inventory levels reduces the cost of possible interruptions in the production process and the loss of business due to scarcity of products consequently increases the holding cost and the cost of obsolescence. Maintaining high levels of inventory also helps in reducing the cost of supplying the products and protects the firm against price fluctuations as a result of adverse macroeconomic factors (Blinder, 1991).

A positive relationship exists between the ACP and financial performance. This result suggests that firms cannot improve their profitability by reducing the number of days accounts receivable are outstanding. The result can also be interpreted as the less the time it takes for customers to pay their bills the more cash is available to replenish inventory hence the higher the sales realized leading to increase profitability of the firm. This finding implies that managers can not improve profitability by reducing the credit period granted to their customers in the energy and petroleum sector unlike other sectors

as depicted by earlier studies. Energy and petroleum industry is affected by other factors such as exchange rate volatility among others.

Average payment period is negative. This suggests that an increase in the number of day's accounts payable is associated with a decrease in financial performance. This finding holds that more profitable firms pay their bills promptly. This implies that they make their payment to suppliers as soon as they are due to enhance their reputation and creditworthiness. This finding negates the working capital management rule that firms should strive to lag their payments to creditors as much as possible, taking care not to spoil their business relationships with suppliers. In this study, a relationship is sought between WCM and financial performance of energy and petroleum companies listed at the NSE.

5.3 Conclusions

The study has investigated the relationship between working capital management and financial Performance for energy and petroleum firms listed in Nairobi Securities Exchange. Data have been analysed by applying descriptive statistics for the time period of 2003 to 2012. The firm's financial strategy determines the capital structure of the firm. A business requires different types of capital in order to operate. Working capital is often considered to be the most significant type of capital. It is claimed that the amount of this can determine the success of a company. Whenever a need of working capital arises due to increasing level of business activity financing arrangement should be sought quickly. It is very important for firms to manage working capital efficiency. It is important from the

point of view of both profitability and liquidity. Where there is poor management of working capital funds may be unnecessarily tied up in idle assets which reduces company's liquidity.

The study however discovered that the management of working capital in energy and petroleum firms in Kenya is not a key factor that influences the profitability in the sector. The management can create profitability by observing other factors that influence the profitability of a firm e.g. its size, its management exchange rate fluctuation among other factors. The study also found out that firms are capable of gaining sustainable competitive advantage by means of effective and efficient utilization of resources of the organization through a careful allocation. In so doing, the profitability of firms is expected to increase. From the correlation analysis, the variables applied in the study are not significant in explaining sufficiently the profitability of a firm. Another study should be carried out to determine the most significant factor that influences financial performance of energy and petroleum firms in Kenya

5.4 Recommendations

Profitability is a major factor in the going concern of a business. Managers should strive to achieve a reasonable level of profitability in order to maximize their shareholders wealth. The operating activities of a firm listed in the NSE should be such that it could finance a larger percentage of their current liabilities from its operations. In this study the focus is in Energy and Petroleum Industry, a look at CCC which is a major component in working capital shows that a lot of cash is held and the number of days to

inventory is high. Management should strive to maintain a very low CCC so as to increase the profitability of a company.

A longer CCC may have a negative effect on the liquidity of the companies because cash will be tired in raw materials, inventory or account receivables. Managers can therefore create value for their shareholders by reducing the number of days of account receivables and inventories to a reasonable minimum level. Furthermore companies are capable of gaining sustainable competitive advantage by means of efficient and effective utilization of resources. An effective management of the components of current assets, especially the accounts receivables and inventory, is also recommended as it will have a positive effect on the liquidity of firms listed in the NSE.

The study recommends that for energy and petroleum firms to remain profitable they should have good working capital management which will help in making decisions about investment mix and policy, matching investments to objectives, asset allocation for institutions, and balancing risks against profitability.

5.5 Limitations of the Study

The study relied on secondary data which was collected from annual audited financial statement of companies, NSE database and CMA library. In as much as there are general guiding principle for the preparation and reporting of financial statements which are Generally Accepted Accounting Principle (GAAP) and International Financial Reporting

Standards. These companies use different accounting policies and therefore reliability and quality of data was not 100%.

The main limitations of this study were; some data was not readily available. This reduced the probability of reaching a more conclusive study. However, conclusions were made with this available data. The size of the sample could have limited confidence in the results and this might limit generalizations to other situations. The study was also limited to one factor that affect the financial performance of a company. There are many other factors that affect the financial performance of a company e.g. Management, size of the company, exchange rate among others.

Time constraint was a major concern. The time taken to carry out this study was in no means sufficient for the amount of detail and analysis the study involved. With more time, detailed tests could be conducted to determine whether the same conclusion could be derived when more variables are in question.

The study only used one measure of performance i.e. ROE. There are other ratios that are used to measure the performance of a company example Return on Investment, Gross Profit Margin. The study could only be conducted in several sectors leaving out critical sectors like financial services sector e.g. banks and insurance companies due to lack of inventory held at this sectors making the research not useful for such sectors. This results are therefore applicable to only specific sectors and any attempts to generalize findings should be reviewed with care.

The study also had a limitation in terms of the scope because it only concentrated on publicly listed firms and ignored private firms. This may limit fair findings that could have been gotten if a bigger number of observations could have been analyzed. Since the data used is mainly from financial statements of public companies, it's therefore not comfortable to conclude the case is the same as for all private companies and partnerships.

The study only focused on five main variables leaving out many potentially good variables that affect the profitability and hence the results of the model. Therefore the more the variables used not restricting to the model adopted in this study, there are chances that the results may be influenced to give a different opinion or conclusion.

5.6 Suggestion for Further Research

The correlation of liquidity management and profitability is extensive. Thus it is impossible to exhaustively study the subject in a single report. The scope of this study only covers the operations of four listed company in the energy and petroleum industry for a period of ten years. Given enough time and resources it is possible to attempt to study the entire listed companies or all the sectors in Kenya and for a longer period may be twenty to thirty years and using different statistical methods for even better results.

This study has investigated the impact of working capital management on the profitability of the energy and petroleum firms in Kenya. To this end therefore a further study should be carried out to assess the impact of working capital management on the profitability of

other industrial sectors. The analysis of this study shows that there are other factors that affect the profitability of a firm rather than working capital management. The research could be conducted to identify these factors and to what extent they affect profitability as to improve the financial performance of the company.

Further studies can assess the impact of working capital management on operational efficiency of various sectors in the economy. The study focusses on working capital management as the only factor affecting financial performance. A study could be carried out to find out what other factors affect the financial performance of energy and petroleum firms and to what extent they affect.

In addition to this, further studies can assess the effect of Foreign exchange rate on the financial performance of energy and petroleum firms given that we import our petroleum products. The fluctuation in exchange rate may force a firm to stock a lot of fuel in fear of depreciation of the Kenyan currency causing cost of sales rise. Lastly, further studies can assess whether working capital management affects the investment policies and financing decisions in relation to how a firm chooses between alternative sources of funds to enhance financial performance.

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APPENDIX

ENERGY AND PETROLEUM COMPANIES LISTED AT THE NSE

TOTAL KENYA, KENGEN, KENOL KOBIL, KPLC

Input Data

Y	X1	X2	X3	**X4**	**X5**
ROE	**ACP**	**ITID**	**APP**	**CR**	**DR**
0.1954	26.8553	16.3829	22.1404	1.3011	0.9417
0.2471	22.4993	23.7268	17.5676	1.5115	1.0225
0.2281	18.9900	19.9705	21.9427	1.4549	1.0716
0.1804	23.8164	18.7785	20.8033	1.7979	0.5308
0.1191	24.8609	18.3829	17.1913	1.5378	0.5752
0.1395	14.9831	17.4807	27.0545	1.2950	1.5384
0.0953	27.0308	26.2922	29.5400	1.3046	1.7315
0.1398	28.4118	20.3950	17.9565	1.3805	1.5356
0.2810	19.6653	26.9755	22.1014	1.5842	1.9461
0.1750	24.5664	25.5898	17.3486	1.7483	2.0707
0.1249	28.4660	34.9765	30.5200	1.4981	2.5034
0.1276	33.9357	33.8757	32.0600	1.3639	1.3342
0.1151	32.3455	41.5679	31.5600	1.2993	2.9755
0.1042	43.7249	39.5115	49.1100	1.1718	2.2912
0.1103	41.5191	43.5743	45.6600	1.2595	1.6334
0.1403	36.7861	32.8074	53.8100	1.2371	1.8950
0.1238	35.5849	42.8824	42.3000	1.1179	2.5179
0.0956	36.8274	53.7611	50.8700	1.1686	2.1708
0.1078	32.5173	44.7750	36.5600	1.1003	2.8280
0.1014	28.9061	46.4149	33.0714	1.2997	1.3238
0.9046	127.9614	108.8700	138.2000	0.8450	0.8966
0.0262	102.3284	111.4000	127.4900	0.8133	0.8168
0.0672	118.3755	105.4200	135.8000	1.3148	0.9524
0.0800	106.2847	100.5800	104.5700	1.2777	0.7700
0.0772	159.0452	119.7600	171.2900	1.0668	1.5613
0.0739	125.8224	125.0900	162.4100	1.1208	0.6086
0.1201	107.2609	137.5700	130.8300	1.4589	1.2392
0.1293	105.5836	117.9600	168.9900	1.0478	0.6694
0.1065	139.8073	121.0700	174.4200	1.2496	1.1291
0.1061	115.2533	102.0900	134.9800	0.8973	1.3537

0.0546	22.4179	41.4400	113.4100	1.7708	0.6258
0.1704	25.3048	28.9800	100.0612	1.1231	0.7301
0.0466	23.4956	26.4400	117.2700	1.7131	0.8455
0.1033	48.0849	27.5400	103.3500	1.3102	0.4758
0.0384	18.4796	28.1400	117.5000	1.4447	0.7521
0.0862	22.5940	30.6300	141.9100	1.4047	0.7843
0.0309	24.0612	38.4600	129.9100	1.1727	0.5851
0.0466	30.4956	40.4400	116.2700	1.7131	0.8455
0.0300	38.2177	42.6000	132.8700	1.7358	0.8910
0.0402	27.0183	35.5300	125.3800	1.4858	0.9143