

**THE IMPACT OF LIQUIDITY MANAGEMENT ON THE PROFITABILITY OF  
LISTED NIGERIAN FOOD PRODUCTS COMPANIES**

**BY**

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**BEING A DISSERTATION PRESENTED TO THE DEPARTMENT OF  
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**APRIL, 2016**

## **DECLARATION**

I Abdullahi Onotu Suleiman, hereby declare that this work was written by me under the supervision of Associate Professor Hannatu Ahmad Sabo. I accept full responsibility for any mistake(s) and fault that might be found in the study which is not deliberate and is highly regretted. All sources have been duly acknowledged in the references.

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**CERTIFICATION**

This is to certify that the research work for this dissertation was conducted by Abdullahi Onotu Suleiman (SPS/12/MAC/00029). The work was carried out under our supervision.

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**APPROVAL PAGE**

This dissertation titled “Impact of liquidity management on the profitability of listed Nigerian food products companies” has been examined and approved for meeting the requirement for the award of Master of Science (M.Sc.) in Accounting of Bayero University Kano.

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## **DEDICATION**

This research work is dedicated to my late parents, who stood to my enrolment into the primary school to acquire Western form of education.

## ACKNOWLEDGEMENT

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## ABSTRACT

*Effective Liquidity and its management are required for the growth and profitability of a firm. This is because either inadequate liquidity or excess liquidity may be injurious to the smooth operations of the organization. A large number of studies in this area concentrated on bank sector and most of them used only one proxy in measuring profitability. Similar studies are limited in food products sector of the Nigerian economy. It is on this basis that this study examined the impact of liquidity management on the profitability of listed Nigerian food products companies. The study utilized secondary data collected from annual reports and accounts of the food products companies for the periods of 2004 to 2013. Data was first analyzed by means of descriptive statistics to provide summary statistics for the variables and subsequently, correlation analysis was carried out using Pearson Correlation Technique for the correlation between the dependent and independent variables. A Panel Data Regression Technique was employed since the data has both time series and cross sectional attributes. It was found that Cash Conversion Circle has a positive relationship with ROA but the relationship is not statistically significant, Cash conversion circle has a positive relationship with ROE and the relationship is statistically significant, size is positively and statistically significant, while growth and leverage has negative relationship and is not statistically significant. The study recommends that managers can increase profitability by putting in place good credit policy and short cash conversion cycle and Managers should strive to achieve a reasonable level of profitability in order to maximize their shareholder's wealth.*

# CHAPTER ONE

## INTRODUCTION

### 1.1 Background to the Study

Liquidity management is receiving attention all over the world especially with the current financial situation and the state of the world economy. The concern of business owners and managers all over the world is to devise a strategy of managing their day to day operations in order to meet their obligations as they arise and increase profitability and shareholders' wealth. However, this is in consideration of the fact that no matter the amount spent on equipment, plant and machinery, buildings etc if the ingredients required for production are not efficiently managed, the entire amount committed to the project will become a waste (Akinsuleri 2011).

According to Alshatti (2014), one of the major reasons that may cause liquidation is illiquidity and inability to make adequate profit. These are some of the basic ingredients of measuring the "going concern" of an establishment and for these reasons companies are developing various strategies to improve their liquidity position. (Strategies which can be adopted within the firm to improve liquidity and cash flow concern the management of working capital, areas which are usually neglected in times of favorable business conditions (Pass and Pike, 1984)). However, for the very survival of business, the firm should have requisite degree of liquidity; it should be neither excessive nor inadequate. Excessive liquidity means accumulation of idle funds, which may lead to lower profitability, increase speculation, unjustified extension, extension of liberal credit terms and liberal dividend policy, whereas, inadequate liquidity results in interruption of business operations. Hence, a proper balance between these two extreme situations should be maintained for efficient operation of business through skillful liquidity management (Eljelly, 2004).

The world of cash and liquidity management was once a simpler place, access to capital was rarely a bottle-neck, even for highly-leveraged corporation and many had strong, long-standing relationships with a single bank that helped meet most of their funding and cash management needs. While profitability is a primary goal of all business ventures, without it the business will not survive in the long run. According to Ejelly (2004), Profitability can be defined as either accounting profit or economic profits. Accounting profit provides you with an intermediate view of the viability of a business. Although one year losses may not permanently harm a business, consecutive years of losses (or net income insufficient to cover living expenditures) may jeopardize the viability of your business while Economic profits provide you with a long-term perspective of your business. Liquidity-profitability relationship is linked with the continuance of the appropriate intensity of working capital. This concept tries to strike a level of liquidity that offers a relaxed balance of liquidity and profitability, that is to say, the investment of the company in working capital must be sufficient. It may generally be assumed that there is always a negative relationship between the two, but it is not true in all the cases. While the immediate survival of a business anchors on its liquidity, its long term survival and growth depends on profitability. Thus, liquidity ensures short term survival and profitability ensures long term survival. Both are, therefore important for any firm to survive (Bhunia, Khan & Mukhuti, 2012).

Similarly, the dilemma in liquidity management is to achieve desired trade -off between liquidity and profitability, because insufficient liquidity may spoil the company's goodwill and diminish its credit standing thereby leading to forced liquidation on its assets. On the other hand excessive liquidity undermines profitability through accumulation of wealth that does not bring back any profit to the firm. Its requirement depends on the peculiar nature of the firm and there is no

specific rule on determining the optimal level of liquidity that a firm can maintain in order to ensure positive impact on its profitability (Raheman et al, 2007).

The Food industry is a complex, global collective of diverse businesses that supply most of the food consumed by the world population. The industry used different methods and techniques to transform raw ingredients into marketable food products for human consumption. Only subsistence farmers, who survive on what they grow, can be considered outside of the scope of the modern food industry. In Nigeria this sector has accounted more than 12% of the total market capitalization of the entire consumer goods sector as at 2013 (NSE FACT BOOK 2013).

There are many studies (see for example chapter two), which indicate that liquidity is very important to companies because of their limited access to credit from the financial markets (Padachi 2011). Food industry maintains high liquidity which makes working capital management (WCM) very important in relation to profitability because WCM is concerned with current asset and current liabilities of a firm Gill et.al (2010).

This study aims to determine the relationship between the liquidity and profitability of the Nigerian listed food products companies.

## **1.2 Statement of the Problem**

Business financing, especially at the wake of the global financial crisis, has become a major source of concern for business managers as bank loans are becoming too expensive to maintain as a result of tightening of both the local and international financial market and the reluctance of the public to invest in the share of companies sequel to the crash of the capital market (Ali 2012). These situations compel business managers to device various strategies of managing internally

generated revenue to enhance their chances of making profit and meeting existing shareholders expectations.

Every business relies on its clients to succeed and so it is a strategic business plan to build good client relationships, liquidity crisis, if not properly managed can destroy those relationships instantly. In order to avoid liquidity crisis, management of businesses need to have a well-defined policy and established procedures for measuring, monitoring, and managing liquidity. Managing liquidity is therefore a core daily process requiring managers to monitor and project cash flow to ensure that adequate liquidity is maintained at all times (Afza & Nasir, 2009). There is consensus in theoretical literature that profitability and liquidity constitute the most prominent issues in corporate finance literatures (Akinsuleri 2011). While it may be true that the ultimate goal for any firm is to maximize profit, too much attention on profitability may lead the firm into a pitfall by diluting the liquidity position of the organization (Nires, 2012). Therefore the need to strike a balance between the firm's desire to make profit and the desire to remain liquid cannot be over-emphasized and there arises the issue of liquidity management.

According to Alshatti (2014) one of the major reasons that may cause liquidation is illiquidity and inability to make adequate profit. These are some of the basic ingredients of measuring the "going concern" of an establishment. For these reasons companies are developing various strategies to improve their liquidity position. Strategies which can be adapted within the firm to improve liquidity and cash flows concern the management of working capital, areas which are usually neglected in times of favorable business conditions (Pass & Pike 1984).

Profitability is not cash flow; people often mistakenly believe that a profitable business will not encounter cash flow problems. Although closely related, profitability and cash flow are different

because an income statement lists income and expenses while the cash flow statement lists cash inflow and cash outflows.

Liquidity management and profitability are very important issues in the growth and survival of business and the ability to handle the trade-off between the two is a source of concern for financial managers. Liquidity management and profitability are needed in the development, survival, sustainability, growth and performance of a business (Ahmed, 2010). Profitability does not translate to liquidity in all cases. A company may be profitable without necessarily being liquid. Therefore, liquidity should be managed in order to obtain an optimal level, that is, a level that avoid excess liquidity which may translate to poor quality of management. Also liquidity level should not fall below minimum requirement as it will lead to the inability of the organization to meet short term obligation that are due (Begchi & Khamruiz, 2012).

Return on assets measures management's ability to earn a return on the firm's resources (assets). The income amount used in this computation is income before the deduction of interest expense, since interest is the return to creditors for the resources that they provide to the firm while common or ordinary shareholders are entitled to the residue profits. The rate of dividend is not fixed; the earnings may be distributed to shareholders or retained in the business. Nevertheless, the net profit after tax represents their return. A return on shareholder's equity is calculated to see the profitability of owners' investment.

Cash Conversion Cycle is another measure of corporate liquidity management (Moss & Stine, 1993). It measures the time lag between cash payments for purchase of inventories and collection of receivables from customers. The CCC is used as a comprehensive measure of liquidity management as it shows the time lag between expenditure for the purchase of raw materials and

the collection of sales of finished goods (Padachi, 2006). The day to day management of firm's short term assets and liabilities plays an important role in the success of the firm. Firms with glowing long term prospects and healthy bottom lines do not remain solvent without good liquidity management (Jose, et al., 1996).

A number of studies have been conducted on liquidity and profitability at different times in developed, as well as developing countries, most of which are well documented in accounting and finance literature. These studies include that of Lamberg and Valming (2009); Bordeleau and Graham (2010); Saleem and Rehman (2011); Fathi, Hashemi, and Firuzkuhi (2011); Niresh (2012); Uremadu (2012); Usama (2012); Alnimer, Warrad and Al Omari (2013); Agbada and Osuji (2013); Zygmunt (2013); Victor and Antwi (2013); Godfred (2013); Ifurueze (2013); Gil et.al (2010), Mathuwa (2010) and Kurawa and Abubakar (2014).

Lamberg and Valming (2009) examined the impact of liquidity management on the profitability of Swedish corporations. The study used return on asset to measure profitability while acid test ratio was used to measure liquidity. Bordeleau and Graham (2010) determined the impact of liquid assets holding on banking profitability of Canadian and US Banks. The study used return on equity to measure the profitability. Saleem and Rahman (2011) presented the relationship between liquidity and profitability of oil and gas companies in Pakistan. The study used return on asset, return on equity to measure the profitability, current ratio, quick and liquid ratio were used for liquidity.

Agbada and Osuji (2013) evaluated the efficiency of liquidity management and banking performance in Nigeria. The study used return on capital employed and return on asset to measure profitability. Usama (2012) studied the effect of working capital management on profitability of the food sector in Pakistan. The study used net operating profit to measure

profitability while average collection period, and cash conversion cycle were used to measure liquidity. Zygmunt (2013) recognized the impact of liquidity on profitability of Polish companies in Poland. The study used ROE and ROA to measure profitability while current ratio, quick ratio and receivable conversion period were used to measure liquidity.

Al Nimer, Warrad and Al Omar (2013) studied the impact of liquidity on profitability of Jordan Banks. The study used ROA to measure profitability and quick ratio to measure liquidity.

Uremadu (2012) examined the impact of capital structure and liquidity on the corporate returns of Nigerian manufacturing firms. The study used only returns on equity as proxy for profitability while liquidity ratio to total liability was used to measure liquidity.

Godfred (2013) investigate the relationship between the working capital management and profitability of UK small and medium enterprise (SME) companies. The study used both return on asset and return on equity as proxies for profitability while Cash Conversion Cycle and account receivable period were used to measure liquidity.

Niresh (2012) studied the trade - off between liquidity and profitability of manufacturing firms in Srilinka. The study used return on capital employed and return on equity as proxies for profitability while current ratio, quick ratio and liquid ratio were used to measure liquidity.

Victor Antiwi and Boadi studied the relationship between the liquidity and the profitability of banks in Ghana. The study used return on asset to measure profitability and temporary investment ratio to measure liquidity. Gil et.al (2010) studied the relationship between working capital management and profitability of USA firms. The study used gross operating profit to measure profitability and Cash Conversion Cycle to measure liquidity. Mathuwa (2010) examined the influence of working capital management on profitability of listed companies in

Kenya. The study used net operating profit to measure profitability while account receivable, account payable and inventory control period were used as proxies for liquidity.

Most of these studies used only one proxy such as Net Operating Profit (NOP), Gross Operating Profit (GOP), Return on Assets (ROA), and Return On Equity (ROE) to measure profitability and concentrated on banking and manufacturing sectors. However, to the best of the researcher's knowledge, similar studies are limited in food products sector of the Nigerian economy. Therefore, this study was carried out to fill this gap, that is, the study focuses on the Nigerian food products companies. The study used Cash Conversion Cycle as a measure of liquidity and both Return on Assets (ROA) and Return on Equity (ROE) as a measure of profitability.

The research examined the impact of liquidity management on the profitability of Nigerian food product companies and as such, this study intends to provide answers to the following questions.

- a) What is the impact of Cash Conversion Circle on the Return on Assets (ROA) of listed Nigerian food products companies?
- b) What is the impact of Cash Conversion Circle on the Return on Equity (ROE) of listed Nigerian food products companies?

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

The main objective of the study is to examine the impact of liquidity management on the profitability of food products companies in Nigeria. The specific objectives of the study are:

- i. To determine the relationship between cash conversion circle and Return on assets (ROA) of listed Nigerian food products companies;

- ii. To determine the impact of cash conversion circle on Return on equity (ROE) of listed Nigerian food products companies;

#### **1.4 Research Hypotheses**

Based on the statement of problem and objectives of the study, the following hypotheses are formulated in null ( $H_0$ ) form to guide the study:

**H<sub>01</sub>:** There is no significant relationship between Cash Conversion Circle and Return on Assets (ROA) of listed Nigerian food products companies.

**H<sub>02</sub>:** There is no significant relationship between Cash Conversion Circle and Return on equity (ROE) of listed Nigerian food products companies.

#### **1.5 Scope of the Study**

This research work focused on the listed Nigerian food products companies. This study covered only the impact of liquidity on the profitability of food Products Companies and as such, it will explain the concept of liquidity and the measure of liquidity is Cash Conversion Cycle (CCC). On the other hand, the measures of profitability are Return on Asset (ROA), Return on Equity (ROE). This categorization is in line with earlier studies like Eric, Linda and Francis (2013), Owolabi & Solomon (2012). The study covered a period of ten years (2004 to 2013). The period of ten years is an improvement upon the span used by most researches where scope ranges from 5 to 8 years, and it is considered adequate to determine the impact of liquidity on profitability of listed Nigerian food products companies.

#### **1.6 Significance of the Study**

This study is significant because to the best of the researcher's knowledge none of the studies conducted on liquidity profitability specifically assessed the impact of liquidity management on the profitability of listed Nigerian Food Product companies.

Though some earlier studies may take some food product companies as sampled companies, these may not be sufficient to explain the impact of liquidity management on the profitability of listed Nigerian food product companies. The study is also significant for the following reasons;

- i. To the researcher, it marked the beginning of efforts to adding to existing knowledge. For the academic world, this study shed some light on the liquidity management which has received prominence since the recent global credit crunch;
- ii. For practitioners, this study will be relevant to financial analysts, managers and directors particularly those working in food product companies.
- iii. From the Management Point of View, the study will play a vital role in providing information which is needed for planning, decision-making and control.
- iv. From the Creditors Point of View: Creditors doing business with company simply study its performance by current ratio, acid test ratio, and debt to assets, equity and capitalization, interest coverage and principal coverage before lending the finance.

The result of this study would make a good library material for researchers, as well as, serving as a reference material for researchers who may wish to conduct similar studies in this area. Besides that, there exist few studies on liquidity and performance in Nigeria. This study will therefore, extend the frontiers of knowledge.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter reviews a range of literature and concept relating to liquidity management and profitability. The review also covers empirical studies that were conducted on relationship between liquidity management and performance, focusing attention on the research problem, methodology, findings and limitations. Similarly, literature on liquidity management and profitability were reviewed in order to use the evidence from the studies to establish the gaps in the literature and also to serve as a basis for validation of the findings of this work.

#### **2.2 Conceptual Definition**

##### **2.2.1 The Concept of Liquidity**

It will be difficult for business concern to take financial decision related to the determination of the amount of long-term finance required and the sources from which such finance is to be raised. The optimum capital structure should be determined by keeping in mind the long-term and short-term requirement of finance. Short-term solvency much depends upon the availability of liquid resources as short-term requirements. No businessman can aspire to keep surplus fund in the business and while developing these surplus funds he has to estimate its short-term requirements. Therefore, the need to strike a balance between the firm's desire to make profit and the desire to remain liquid cannot be over-emphasized and there arises the issue of liquidity management (Niresh, 2012).

Liquidity refers to the ability of a firm to meet its short term obligations (Niresh, 2012). A study of liquidity is of major importance to both the internal and external analysts because of its close

relationship with day to day operations of a business (Bhunias, 2010). A weak liquidity position poses a threat to the solvency as well as profitability of a firm and makes it unsafe and unsound (Niresh, 2012).

Liquidity from an investor's view point, is the degree to which an asset or security can be bought or sold in the market without affecting the asset's price (Financial Dictionary.com.2010). Assets that can be easily bought or sold are known as liquid assets. It is the ability to convert an asset to cash quickly with little or no loss in value. (www.investopedia).

Financial liquidity is a measure of the extent to which a person or organization has cash to meet immediate and short-term obligations, or assets that can be quickly converted to do this (Vieira, 2010). Accounting liquidity is the ability of current assets to meet current liabilities.

There is no specific liquidity formula, however, liquidity is often calculated by using liquidity ratios. Liquidity is the term used to describe how easy it is to convert assets to cash. The most liquid asset, and what everything else is compared to, is cash. This is because it can always be used easily and immediately (Owolabi & Solomon, 2012).

Certificates of deposit are slightly less liquid, because there is usually a penalty for converting them to cash before their maturity date. Saving bonds are also quite liquid, since they can be sold at a bank fairly easily. Finally, shares of stock, bonds, options and commodities are considered fairly liquid because they can usually be sold readily and you can receive the cash within a few days. Each of the above can be considered as cash or cash equivalents because they can be converted to cash with little effort, although sometimes with a slight penalty. According to businessdictionary.com (2010), the term 'Liquidity' means the ability of an organization to convert assets into cash during the normal course of business and to have regular uninterrupted

flow of cash to meet outside current liabilities as at when due and payable and also ensure availability of money for day-to-day business operations. The concept of liquidity in case of companies has two dimensions viz; the quantitative and qualitative. The quantitative aspect includes the quantum, structure and utilization of liquid assets. The qualitative aspect emphasizes upon the ability of a firm to meet all present and potential demand on cash in a manner that minimize cost and maximize the value of the business (Vieira 2010).

Liquidity management is a concept that is receiving serious attention all over the world especially with the current financial situations and the state of the world economy. The concern of business owners and managers all over the world is to devise a strategy of managing their day to day operations in order to meet their obligations as they fall due to increase profitability and shareholder's wealth. Liquidity management, in most cases, are considered from the perspective of working capital management as most of the indices used for measuring corporate liquidity are a function of the components of working capital (Eljelly, 2004).

The importance of liquidity management as it affects corporate profitability in today's business cannot be overemphasized. The crucial part in managing working capital requires maintaining its liquidity in day-to-day operation to ensure its smooth running and meets its obligation (Eljelly, 2004). Liquidity plays a significant role in the successful functioning of a business firm. A firm should ensure that it does not suffer from lack of or excess liquidity to meet its short-term compulsions. A study of liquidity is of major importance to both the internal and the external analysts because of its close relationship with day-to-day operations of a business (Bhunia, 2010). Dilemma in liquidity management is to achieve desired trade off between liquidity and profitability (Raheman et al, 2007). Liquidity requirement of a firm depends on the peculiar

nature of the firm and there is no specific rule on determining the optimal level of liquidity that a firm can maintain in order to ensure positive impact on its profitability.

### **2.2.2 The Concept of Profitability**

According to Lamberg and Valming (2009) Profit is an excess of revenues over associated expenses for an activity over a period of time. Terms with similar meanings include ‘earnings’, ‘income’, and ‘margin’. Lord Keynes concludes that ‘Profit is the engine that drives the business enterprise’. Every business should earn sufficient profits to survive and grow over a long period of time. It is the index to the economic progress, improved national income and rising standard of living. No doubt, profit is the legitimate object, but it should not be over emphasized. Thus, profit is not just the reward to owners but it is also related to the interest of other segments of the society. Profit is the yardstick for judging not just the economic, but the managerial efficiency and social objectives also (Owolabi and sololmon, 2012).

Profitability means ability to make profit from all the business activities of an organization, company, firm, or an enterprise. It shows how efficiently the management can make profit by using all the resources available in the market. According to Harward & Upton (2010) “profitability is the ‘the ability of a given investment to earn a return from its use.’” However, the term ‘Profitability’ is not synonymous to the term ‘Efficiency’. Profitability is an index of efficiency and is regarded as a measure of efficiency and management guide to greater efficiency. Though, profitability is an important yardstick for measuring the efficiency, the extent of profitability cannot be taken as a final proof of efficiency. Sometimes satisfactory profits can mark inefficiency and conversely, a proper degree of efficiency can be accompanied by an absence of profit. The change in operational efficiency is merely one of the factors on

which profitability of an enterprise largely depends. Moreover, there are many other factors besides efficiency, which affect profitability.

### **2.3. Liquidity.**

A company can sell lots of widgets and have good net earnings, but if it cannot collect the actual cash from its customers on a timely basis, it will soon fold up, unable to pay its own obligations as at when due. This is why the understanding of liquidity is important for investors, the liquidity of companies that we may wish to invest in ([www.investopedia.com](http://www.investopedia.com)).

Several ratios look at how easily a company can meet its current obligations. One of these is the current ratio, which compares the level of current assets to current liabilities. Remember that in this context, "current" means collectible or payable within one year. Depending on the industry, companies with good liquidity will usually have a current ratio of more than two. This shows that a company has the resources on hand to meet its obligations and is less likely to borrow money or enter bankruptcy (Ajantha, 2013). A more stringent measure is the quick ratio, sometimes called the acid test ratio. This uses current assets (excluding inventory) and compares them to current liabilities. Inventory is removed because, of the various current assets such as cash, short-term investments or accounts receivable, this is the most difficult to convert into cash. A value of greater than one is usually considered good from a liquidity viewpoint, but this is industry dependent. One last ratio of note is the debt/equity ratio, usually defined as total liabilities divided by stockholders' equity. Generally, companies with a higher debt/equity ratio will be less liquid, as more of their available cash must be used to service and reduce the debt. This leaves less cash for other purposes.

Liquidity is important for both individuals and companies. While a person may be rich in terms of total value of assets owned, that person may also end up in trouble if he or she is unable to convert those assets into cash. The same holds true for companies. Without cash coming in the door, they can quickly get into trouble with their creditors. Banks are important for both groups, providing financial intermediation between those who need cash and those who can offer it, thus keeping the cash flowing. An understanding of the liquidity of a company's stock within the market helps investors judge when to buy or sell shares. Finally, an understanding of a company's own liquidity helps investors avoid those that might run into trouble in the near future ([www.investopedia.com](http://www.investopedia.com))

### **2.3.1 The Need and Importance of Liquidity Management**

The need for liquidity management could not be over emphasized. The efficient management of liquidity is an integrated part of overall finance management and has a bearing on the objective of the consolidation of short-term solvency position Pandey (2005). To achieve this, it is necessary to generate sufficient liquid fund. The extent to which liquidity can be gained will naturally depend upon the magnitude of the sales. The efficiency of collection department, the lowest period of operating cycle and a successful collection programmer are in other words, necessary for maintaining liquidity by any business enterprises. Those sales not converted into cash instantly create a time lag between the sales of goods and receipt of cash. There is therefore a need for liquidity in the form of cash and bank balance, marketable security and bills receivables. Sufficient liquidity is necessary to ascertain the ability to pay short-term obligations. Technically, liquidity depends upon the production /operating cash cycle. "The continuing flow from the Conversion of cash into inventory, Conversion of inventory into receivable, and Conversion of receivable into cash is what is called operating cycle Akinsuleri (2011). "Thus, the

operating cycle is a continuous process. If it is possible to complete the sequences instantaneously, there would be no need for liquid fund. But since it is not possible, and cash inflows and outflow don't match, firms have to keep cash or invest in short-term liquid securities”.

Similarly, business concern must have adequate Inventory to guard against the possibility of not being able to meet a demand for their products. Adequate inventory therefore provides a cushion against being out of stock and enhances sales. If the firms have to be competitive they must sell goods to their customers on credit which make account receivable. It is in these ways that an adequate level of working capital is absolutely necessary for smooth sales activity which, in turn, enhances the liquid position of the concerns. Pandi (2005) list the need and importance of liquidity management as follows:

**(i) Management of Short-term Solvency**

Liquidity or availability of liquid resources gives an indication of the capacity to pay its short-term obligation. This kind of information is valuable for short-term creditors, present and future investors.

**(ii) Management of the Efficiency of the Credit Department**

In the normal course of the business no firm can stick to cash sales only. Every business concern has to sell on credit; if the collection for debts is very slow, it will affect the quantum of liquid resources. The firm concern may feel difficulty in paying short-term liabilities. Thus, it is very necessary to know the efficiency of collection department and sufficient amount of collection will be hence, the liquidity of the firm.

### **(iii) Inter-firm Comparison**

As regard the liquidity, one can compare the position of different firms, in case of paying its short-term liabilities. Thus, on the basis of liquidity inter firm comparison may also be done.

### **(iv) Early Payment to Suppliers**

Sufficient liquidity will enable the firm to make payment to its suppliers immediately. Similarly, the firm may not feel difficulty in acquiring raw materials regularly and consequently the production activity may be continued without any obstruction.

### **(v) Benefits of Cash Discount**

If a firm has sufficient liquidity, it can get the benefit of cash discount on goods purchased and by doing this, the production cost will be decreased and the firm may reduce its prices and will be able to compete better.

### **(vi) Payment of Dividend**

Due to lack of liquidity, sometimes it happens that business activities are going very smoothly but the firm concern is not able to pay dividend. This situation arises when the quantum of credit sales is very high consequently, the business concern is not able to pay dividend while the profit and loss account show the sufficient profits but if it has sufficient profit and liquidity, it may pay attractive dividend which will make the shareholders to get full satisfaction and the prices of the security will also remain static.

### **(vii) Increase in Credit and Capacity of Getting Loans**

The institutions, which have sufficient liquid resources, may be treated as institutions having good financial position. This type of institution may get loan and advances when needed.

Secondly, the institution will be able to run its manufacturing and trading activity continuously without any difficulty.

**(viii) Helpful in Payment of Contingencies**

In case of contingent events and trading difficulties the firm concern can face them easily, if it has sufficient liquid resources.

**(ix) Increase in Efficiency**

Sufficient liquid resources will psychologically motivate directors and managers and they will be more inspired to work with zeal. Similarly, if the employees get their salary with allowances in time, they will work more effectively. Thus, sufficient liquid resources physiologically, motivate managers as well as employees and by this the efficiency of the concern will increase.

**2.3.2 The Operating Cycle:** Is the length of time it takes to acquire inventory of raw materials, convert them to finished products, sell them and collect cash from sales. This operating cycle begins life as inventory. It is converted to accounts receivables when it is sold and it is finally converted to cash when we collect cash from sales.

**2.3.3 The Cash Cycle:** Is the number of days that passes before firm collect the cash from sales measured from when firm actually pay for the inventory. Cash Cycle is therefore the difference between operating cycle and the accounts payable period.

**2.3.4 Components of Corporate Liquidity Management**

Some of the key components of liquidity management are cash or cash flow management and debtors'/creditors' management which are explained below by Akinsulele (2011).

## **A. Cash /Cash flow Management**

No business can survive without adequate funding i.e. cash. The success of any business venture is therefore predicted on how the management has planned and controlled its cash flows, the amount of cash a company can keep on hand or 'on short call' at a bank depends on the need for the cash Akinsleri (2010).

Cash can be managed efficiently using the two methods stated below:

- i. Cash budgeting
- ii. Cash planning

### **i. Cash Budgeting**

This entails predicting the company's cash utilization and generations with a view to identifying periods of deficit and surplus. During the periods of deficit, the company's treasurer liaises with the banks for the purpose of raising funds. The period of surplus will require that the treasurer invest on short term basis in order to prevent the surplus from becoming idle (Working Capital Management, page 488).

Cash budgets, whether prepared on an annual, monthly, weekly or even a daily basis, can only be estimates of cash flows. Even the best estimates will not be exactly correct, so deviations from the cash budget are inevitable.

This uncertainty about actual cash flows ought to be considered when the cash budget is prepared. It is desirable to prepare additional cash budgets based on different assumptions about sales levels, costs, collection periods, bad debts and so on.

## **ii. Cash Planning**

This involves ensuring that the company's financial resources are effectively policed, customers effect payments as at when due and banking company's cash as soon as possible instead of causing the company cash to be idle.

Cash management is a broad term that refers to the collection, concentration, and disbursement of cash. The goal is to manage the cash balances of an enterprise in such a way as to maximize the availability of cash not invested in fixed assets or inventories and to do so in such a way as to avoid the risk of insolvency. Factors monitored as a part of cash management include a company's level of liquidity, its management of cash balances, and its short-term investment strategies (Working Capital Management, page 491).

A firm's cash flow is the movement of cash in and out of the firm in the form of payments to suppliers and collections from customers. Cash flows typically arise from three sources: operations, investing, and financing.

Business firms must file a Statement of Cash Flows as one of their required financial statements. The Statement of Cash Flows shows the movement of cash through operations (current assets and liabilities), investing (plant and equipment and investments), and financing (long-term financing and dividends).

According to Owolabi (2012) Cash flows are essential to the liquidity or solvency of the business firm. Cash flows are not the same thing as profit. Profit is arrived at through developing the income statement by accrual accounting. In order to develop the Statement of Cash Flows, you take the data from the income statement and use cash accounting to convert profit to cash flows.

Companies need to keep a close eye on their cash flows. To do this, they should develop cash budgets on at least a monthly basis. Developing a cash budget means comparing cash receipts or revenues with cash disbursements or payments and determining net cash flow. This is how the small business owner knows how much cash is available each month.

In some ways, managing cash flow is the most important job of business managers. If at any time a company fails to pay an obligation when it is due because of the lack of cash, the company is insolvent. Insolvency is the primary reason firms go bankrupt. Obviously, the prospect of such a dire consequence should compel companies to manage their cash with care. Moreover, efficient cash management means more than just preventing bankruptcy. It improves the profitability and reduces the risk to which the firm is exposed. Cash management attempts, among other things, to reduce the time it takes to collect the cash that is owed to a firm and manage the concentration of the cash collected. The rationale for such a move is to have complete control of the cash and to provide greater investment opportunities with larger sums of money available as surplus.

Another aspect of cash management is to know a company's optimal cash balance. There are a number of methods that try to determine this magical cash balance, which is the precise amount needed to minimize costs yet provide adequate liquidity to ensure that bills are paid on time (hopefully with something left over for emergency purposes). One of the first steps in managing the cash balance is measuring liquidity, or the amount of money on hand to meet current obligations. There are numerous ways to measure this, including: the Cash to Total Assets ratio, the Current Ratio (Current Assets divided by Current Liabilities), the Quick Ratio (Current Assets less inventory, divided by Current Liabilities), and the Net Liquid Balance (Cash Plus Marketable Securities less Short-term notes Payable, divided by Total Assets). The higher the

number generated by the liquidity measure, the greater the liquidity-; and vice versa. However, there is a tradeoff between liquidity and profitability which discourages firms from having excessive liquidity.

Torre (1997) defines treasury (cash) management as a set of techniques that act on the short-term liquidity of a company, and at the same time affect those factors and processes that translate immediately into cash, with the ultimate aim of increasing both the liquidity and profitability of the company. In this sense Cash Management is the back bone of Liquidity Management as it affects corporate profitability. Cash in excess of what is required need to be invested in short term securities pending when it is required. The major problem faced by most businesses is the ability to determine the minimum cash level required by the business. Minimum cash level assist management to maintain enough cash to meet its day-to-day operating expenses Owolabi (2012).

To prevent breaks or gaps in the trading cycle due to lack of cash, administrators must calculate the cash amount best suited to their level of activity, plan the timing of the relevant payments and collections and draw up a policy of investment in assets with high liquidity that can be converted to cash at a low transactional cost to serve as support for the treasury funds maintained by the company (Kamath, 1985; Srinivasan & Kim, 1986). It is therefore essential to establish the right level of disposable assets to short-term financial investments at companies. Holding the wrong amount in cash or cash equivalent may interrupt the normal flow of business activities. Moreover, the wrong safety margin may result in financial difficulties, with firms unable to meet needs that may arise at any given time or unable to take advantage of unexpected investment opportunities. Maintaining a cash surplus thus has a number of advantages. It enables companies to carry on the normal transactions that arise in the course of their activities and avoid any

treasury gaps. It also helps them cover any unexpected needs for cash by acting as a preventive balance. However, there are also disadvantages in being too conservative, as reflected in the opportunity costs entailed by assets with little or no profitability.

## **B. Debtors Management**

Debtors are people or businesses who owe the firm some money. Proper management of debtors will help the firm get paid faster and prevent bad debts. Prompt collection of debtors' accounts will also help firm maintain a healthy cash flow.

Debtor management means the process of decisions relating to the investment in business debtors. It is certain that we have to pay the cost of getting money from debtors and to take some risk of loss due to bad debts. To minimize the loss due to not receiving money from debtors is the main aim of debtor management. Economic conditions and firms credit policies are the chief influence on the level of a firm's account receivable (James, 2002). The trade-off between increase in the market share through credit sales and the collective ability of the account receivable affects firm's liquidity and its eventual profitability. A firm may report large profit and still suffer liquidity problem if the bulk of its transactions are in account receivable and collection policy is not effective. Credit and collection policies encompasses the quality of accounts accepted, the credit period extended, the cash discount given, certain special terms and the level of collection expenditure. In each case, the credit decision involves a trade-off between the additional profitability and the cost resulting from a change in any of these elements.

According to Lawrence (2003), the objective of managing accounts receivable is to collect receivable without losing sales from high-pressure collection techniques. Accomplishing this objective encompasses; credit selection and standard which involve the application of technique

for determining which customer should receive credit. This process involve evaluating the customer's creditworthiness and comparing it to the firm's credit standard, its minimum requirements for extending credit to customers and credit monitoring which involves ongoing review of the firm's account receivable to determine whether customers are paying according to the stated credit terms. Slow payments are costly to a firm's investment in account receivable.

Credit policy effects debtor management because it guides management about how to control debtors and how to make balance between liberal and strict credit. If company does not restrict the sale of products on credit after a given limit of sale, the liberated credit policy will increase the amount of sale and profitability Pandy (2005). But risk will also increase with increasing sale, if the company sell the good to those debtors whose capability to pay is not good, then it is possible that some amount will become bad debts. Company can increase the time limit for paying by such debtors. On the other hand, if company's credit policy is strict, then it will increase liquidity and security, but decrease the profitability. So, finance manager should make credit policy at optimum level where profitability and liquidity will be equal.

#### **2.4 Factors that affect Liquidity Requirement of A Company**

The company must maintain adequate amount of liquidity to meet its daily obligations but liquidity in excess of what is adequately required by the firm to finance its operations may be counter-productive. The liquidity requirement of firms differs depending on the circumstances of the company. Pandy (2005) outlined the following as some of the factors that influence the liquidity requirement of a company.

### **2.4.1 Nature and Size of Business**

The liquidity needs of a firm are basically influenced by the nature of its business. Trading and financial firms generally have a low investment in fixed assets, but require a large investment in working capital. Retail stores, for example, must carry large stocks of a variety of merchandise to satisfy the varied demand of their customers. Some manufacturing businesses like tobacco and construction firms also have to invest substantially in working capital but only a nominal amount in fixed assets. In contrast, public utilities have a limited need for working capital and have to invest abundantly in fixed assets. Their working capital requirements are nominal because they have cash sales only and they supply services, not products. Thus, the amount of funds tied up with debtors or in stocks is either nil or very small. The working capital needs of most of the manufacturing concerns fall between the two extreme requirements of trading firms and public utilities.

### **2.4.2 Manufacturing Cycle**

The manufacturing cycle starts with the purchase of raw materials and is completed with the production of finished goods. If the manufacturing cycle involves a longer period the need for working capital will be more, because an extended manufacturing time span means a larger tie-up of funds in inventories. Any delay at any stage of manufacturing process will result in accumulation of work-in-process and will enhance the requirement of working capital. Firms making heavy machinery or other such products, involving long manufacturing cycle, attempt to minimize their investment in inventories (and thereby in working capital) by seeking advance or periodic payments from customers.

### **2.4.3 Business Fluctuations**

Seasonal and cyclical fluctuations in demand for a product affect the working capital requirement considerably, especially the temporary working capital requirements of the firm. An upward swing in the economy leads to increased sales, resulting in an increase in the firm's investment in inventory and receivables or book debts. On the other hand, a decline in the economy may register a fall in sales and, consequently, a fall in the levels of stocks and book debts. Seasonal fluctuations may also create production problems. Increase in production level may be expensive during peak period. A firm may follow a policy of steady production in all season and their quick disposal in peak season. Therefore, financial arrangement for seasonal working capital requirement should be made in advance. The financial plan should be flexible enough to take care of any seasonal fluctuation.

### **2.4.4 Production Policy**

If a firm follows steady production policy, even when the demand is seasonal, inventory will accumulate during off-season periods and there will be higher inventory costs and risks (Begchi & Khamruiz 2012). If the costs and risks of maintaining a constant production schedule are high, the firm may adopt the policy of varying its production schedule in accordance with the changes in demand. Firms whose physical facilities can be utilized for manufacturing a variety of products can have the advantage of diversified activities. Such firms manufacture their main products during the season and other products during off-season. Thus, production policies may differ from firm to firm, depending upon the circumstances. Accordingly, the need for working capital will also vary.

### **2.4.5 Credit Terms**

The credit policy of the firm affects the size of working capital by influencing the level of book debts. Though the credit terms granted to customers to a great extent depend upon the norms and practices of the industry or trade to which the firm belongs; yet it may endeavor to shape its credit policy within such constraints. A long collection period will generally mean tying of larger funds in book debts. Slack collection procedures may even increase the chances of bad debts.

The working capital requirements of a firm are also affected by credit terms granted by its creditors. A firm enjoying liberal credit terms will need less working capital.

### **2.4.6 Growth and Expansion Activities**

As a company grows, logically, larger amount of working capital will be needed, though it is difficult to state any firm rules regarding the relationship between growth in the volume of a firm's business and its working capital needs. The fact to recognize is that the need for increased working capital funds may precede the growth in business activities, rather than following it. The shift in composition of working capital in a company may be observed with changes in economic circumstances and corporate practices. Growing industries require more working capital than those that are static. This could be measured using the percentage increase in total assets

### **2.4.7 Operating Efficiency**

Operating efficiency means optimum utilization of resources. The firm can minimize its need for working capital by efficiently controlling its operating costs. With increased operating efficiency the use of working capital is improved and pace of cash cycle is accelerated. Better utilization of resources improves profitability and helps in relieving the pressure on working capital. Operating efficiency can be measured using the Total Asset to Sale ratios. This measures the percentage of

investment in assets that is needed to generate the annual sales level. If the percentage is very high, it probably indicates that a business is not being aggressive in its sales efforts.

#### **2.4.8 Price Level Changes**

Generally, rising price levels requires a Credit Terms. The credit policy of the firm affects the size of working capital by influencing the level of book debts. Though the credit terms granted to customers to a great extent depend upon the norms and practices of the industry or trade to which the firm belongs; yet it may endeavor to shape its credit policy within such constraints. A long collection period will generally mean tying of larger funds in book debts. Slack collection procedures may even increase the chances of bad debts, the working capital requirements of a firm are also affected by credit terms granted by its creditors, a firm enjoying liberal credit terms will need less working capital.

### **2.5 Measures of Corporate Liquidity Management**

The liquidity of a company is measured with the use of some financial ratios referred to as liquidity ratios. These groups of ratios measure the ability of the firms to meet its current obligations (Liabilities). Analysis of liquidity needs the preparation of cash budgets and cash flow statement; but liquidity ratio, by establishing a relationship between cash and other current assets to current obligations, provided a quick measure of liquidity (Pandy, 2005). The most common ratios, which indicate the extent of liquidity or lack of it, are:

#### **2.5.1 Current Ratio**

Current ratio is a measure of a firm's short term solvency and is calculated by dividing current assets by current liabilities incurred. The current assets are composed of cash and those assets which can be converted into cash in a short period which include marketable securities,

receivables, inventories, and prepaid expenses. Current liabilities consist of all obligations maturing within a year. They include accounts payable, bills payable, note payable, accrued expenses and tax liability. A current ratio that is greater than one is adjudged satisfactory for most business firms even though it is difficult to authoritatively set one standard for all firms. The problem associated with the measure of liquidity with current ratio is that it is the test of quantity and not quality of the assets and hence, it does not reveal the true position of a firm's Liquidity. Current ratio gives the rough idea of the firm's liquidity (Afza & Nasir 2012) and it can be obtained by dividing current assets over current liabilities.

### **2.5.2 Acid test/ Quick Ratio.**

Another measure of corporate liquidity ratio is quick ratio, which indicates the relationship between liquid assets and current liabilities. Quick ratio is calculated by dividing the quick asset (current asset less inventories) by current liabilities. The quick assets are the assets that can be converted into cash immediately without losing their values. Inventories are subtracted from the current assets because they normally require sometime for realizing cash and their value has a tendency to fluctuate.

Quick ratio is considered to be a better guide to the short-term solvency of a firm. A quick ratio is considered to represent a satisfactory current financial condition. However, each industry has its own operating characteristics which demands different financial standards.

The quick ratio, or acid test, is a more specific test of liquidity than the current ratio. It takes inventory out of the equation and measures the firm's liquidity if it does not have inventory to sell to meet its short-term debt obligations. If the quick ratio is less than 1.0 time, then it has to sell inventory to meet short-term debt, which is not a good position for the firm to be in.

Quick Ratio =  $\frac{\text{Current Assets} - \text{Inventory}}{\text{Current Liabilities}}$

### **2.5.2 Cash Conversion Cycle (CCC).**

Cash conversion cycle is another measure of corporate liquidity management (Moss & Stine, 1993). It measures the time lag between cash payments for purchase of inventories and collection of receivables from customers.

Cash conversion cycle is likely to be negative as well as positive. A positive result indicates the number of days a company must borrow or tie up capital while awaiting payment from a customer. A negative result indicates the number of days a company has received cash from sales before it must pay its suppliers (Hutchison et al., 2007). Of course the ultimate goal is having low CCC, if possible negative. Because the shorter the CCC, the more efficient the company is in managing its cash flow. It is obvious that a firm can reduce its need for working capital by reducing the amount of time that goods are held in inventory. This can be accomplished by improving the inventory control process or by having suppliers deliver raw materials exactly when they are needed in the production process, Collecting accounts receivable more quickly are among the methods available to speed up the collection process are improving the efficiency of the collection process, offering discounts to customers who pay faster, and charging interest on accounts that are overdue (Hutchison et al., 2007).

The Cash Conversion Cycle is calculated thus:

Cash Conversion Cycle (CCC) = Inventory Conversion Period + Receivables Collection Period – Creditors Payment Period.

In the formula above, the three variables to which CCC is dependent are defined as follows:

Inventory conversion period (ICP) = Average Inventory/Sales x 365days

Receivables Collection Period (RCP) = Receivables/Sales x 365days

Creditors Payment Period (CPP) = Payables/Cost of Goods Sold x 365days

## **2.6 Measures of Corporate Profitability**

A company should earn profit to survive and grow over a long period of time. Profits are essential, but all management decision should not be profit centered at the expense of the concerns for customers, employees, suppliers or social consequences. Profit is the difference between revenues and expenses over a period of time (usually one year). Profit is the ultimate ‘output’ of a company, and it will have no future if it fails to make sufficient profits. The profitability ratios are calculated to measure the operating efficiency of the company. Some of the profitability ratios include the following:

### **2.6.1 Return on Investment (ROI)**

The term investment may refer to total assets or net assets. The fund employed in net assets is known as capital employed. Net assets equal net fixed assets plus current assets minus current liabilities excluding bank loan. The conventional approach of calculating return on investment is to divide profit after tax (PAT) by investment. Investment refers to pool of funds supplied by shareholders and lenders, while PAT represents residue income of shareholders. The formula of ROI is stated thus:  $ROI = PAT / TOTAL\ ASSET$

### **2.6.2 Return on Equity (ROE)**

Common or ordinary shareholders are entitled to the residue profits. The rate of dividend is not fixed; the earnings may be distributed to shareholders or retained in the business. Nevertheless,

the net profit after tax represents their return. A return on shareholder's equity is calculated to see the profitability of owners' investment. The shareholders' equity or net worth will include paid up share capital, share premium and reserves and surplus less accumulated losses. Net worth can also be found by subtracting total liabilities from the total assets. The ROE is net profit after taxes divided by shareholders' equity which is given by net worth.

$$\text{ROE} = \text{PROFIT AFTER TAX} / \text{NETWORT (EQUITY)}$$

### **2.6.3 Return on Assets (ROA)**

Return on Assets expresses the net income earned by a company as a percentage of the total assets available for use by that company. ROA suggests that companies with higher amounts of assets should be able to earn higher levels of income. ROA measures management's ability to earn a return on the firm's resources (assets). The income amount used in this computation is income before the deduction of interest expense, since interest is the return to creditors for the resources that they provide to the firm. The resulting adjusted income amount is thereby the income before any distribution to those who provided funds to the company. ROA is computed by dividing net income plus interest expense by the company's average investment in asset during the year.

$$\text{ROA} = \text{NET INCOME AFTER TAX} / \text{TOTAL ASSET}$$

## **2.7 Review of Related Empirical Studies**

### **2.7.1 Empirical Studies on Liquidity and Return on Assets**

The relationship between liquidity and return on assets has been established in the existing literatures. For instance, Alshatti (2014) examined thirteen Jordanian Commercial Banks for a period of eight years (2005–2012). The study found a positive effect of the increase in the quick

ratio and the investment ratio of the available funds on the return on assets, and a negative effect of the capital ratio and the liquid assets ratio on the return on assets of the Jordanian Commercial Banks. The study recommends that there is a need for an optimum utilization of the available liquidity in various aspects of investment in order to increase the banks' profitability, and banks should adopt a general framework of liquidity management to assure sufficient liquidity for executing their operations efficiently and they should initiate an analytical study of the evolution rates of liquidity and their ability to achieve a balance between sources and uses of funds.

Similarly, Kurawa and Abubakar (2014) examined the impact of liquidity on the profitability of five randomly selected Nigerian Banks listed on the Nigerian Stock Exchange covering the period from 2003 – 2012. Their results revealed a positive relationship between Return on Asset and Cash and Bank balances to Total Liabilities. Their study found that there is no significant impact between liquidity and profitability among the listed banking firms in Nigeria.

The relationship between liquidity and profitability of oil and gas companies listed on Karachi Stock Exchange (KSE) Pakistan was examined by Saleem and Rehman (2011) using a population of 26 oil and gas companies uncovered a significant impact between liquidity ratio and ROA. According to these studies, liquidity ratios affect the profitability ratio significantly as measured by the ROA.

Toby (2014) analyzed the relationship between working capital management policy and corporate profitability in Nigerian quoted companies. Based on the data of 107 quoted companies spread across 23 sectors for the 2003-2007 period, averages and product-moment correlation coefficients were computed based on measures of Net Current Assets Ratio (NCAR), Return on Assets (ROA) and Net Profit Margin (NPM). He found that the adoption of this strategy

produced negative profitability in most of the sectors. The results also show strong positive correlation between NCAR and selected measures of profitability. It is recommended that companies would maximize profitability and add value by adopting the conservative working capital management strategy (i.e investing more in current assets) provided the operating environment and money markets are robust.

Madhou (2013) examined the determinants of corporate profitability for publicly listed Australian firms by using three measures of corporate profitability, namely, net profit, economic value added and return on assets. Through dynamic panel estimation, the study found evidence supporting that the determinants of corporate profitability of firms in extreme portfolios are heterogeneous and that firms with the worst working capital deficit and poor corporate governance ratings exhibit negative debt ratio. The study concluded that profitable firms hold positive cash holding whereas non- profitable firms hold negative cash holdings.

Taani (2012) determined the impact of working capital management policy and financial leverage on financial performance of Jordanian Companies measured in terms of net income, Return on Equity (ROE) and Return on Asset (ROA). Pearson's rank correlation test, ANOVA F-test, and Multiple Regression Analysis were used on 45 companies included in the industrial sector in Jordan ranked in terms of gross revenues. Results of the study indicated that firm's working capital management policy, financial leverage, and firm size have significant relation to net income. However working capital management policy has no significant impact on return on equity (ROE) and Return on Assets (ROA).

Mansoori and Muhammed (2012) investigated the effect of working capital management on firm's Return on Assets. Using panel data analysis, pooled OLS and Fixed Effect estimation for

a sample of Singapore firms from 2004 to 2011, they found that managers can increase ROA by managing working capital efficiently. Moreover, managers can improve firms' ROA by shortening receivable conversion period and inventory conversion period. And the results of industry analysis suggested the effect of economic sector on relationship between working capital management and ROA.

Similarly, Owolabi and Alu (2012) examined the role of liquidity and working capital management in ensuring going-concern of firms. The result indicated that each working capital component affected the company's level of profitability at varying rates but these effects when pooled together are not significant. To facilitate the smooth running and/or effective management of working capital so as to enhance the level of Return on assets, it was recommended that the companies should adequately plan and control their operations, adjust the shortfalls as noted, consider the principles of finance in their decision making, employ the services of experts (analysts) in complex business areas and conduct periodic stock taking if possible every two weeks.

In the same vein, Khamrui and Bagchi (2012) investigated the relationship between working capital management and firm profitability and to identify the variables that mostly affect profitability. Working capital management is considered to be a vital issue in financial management decision and it has its effect on liquidity as well as on profitability of the firm. Moreover, an optimal working capital management positively contributes to creating firm's value. In this study, we have selected a sample of 10 FMCG (Fast Moving Consumer Goods) companies in India from CMIE database covering a period of 10 years from 2001 to 2009. Profitability has been measured in terms of Return on Assets (ROA).Cash Conversion Cycle

(CCC), interest coverage ratio, age of inventory, age of creditors, age of debtors and debt-equity ratio have been used as explanatory variables. Pearson's correlation and pooled ordinary least squares regression analysis were used in the study. The result confirmed that there was a strong negative relationship between variables of the working capital management and Return on assets of the firm. As the CCC increases, profitability of the firm decreases and managers can create a positive value for the shareholders by reducing the CCC to a possible minimum level. There is also a stumpy negative relationship between debt used by the firm and its profitability.

Vijayakumar and Nadu (2011) investigated the relationship between Cash Conversion Cycle (Liquidity) and firms' Return on Assets. The analysis based on a sample of 20 Indian Automobile firms for the period of 1996-2009 suggested that the managers can increase return on assets of their firms by shortening the Cash Conversion Cycle, accounts receivables period and inventory conversion period. The result suggested that managers can also increase the profitability of their firms by lengthening the accounts payables period. The study suggested an optimal Cash Conversion Cycle as more accurate and comprehensive measures of liquidity analysis.

Lamberg and Valming (2009) examined and compared the use and extent of the liquidity practice before the financial crises and afterward. Furthermore the aim was to measure if the changing of liquidity strategy is related to the profitability measures by return on assets (ROA) using qualitative research strategy. They are of the view that adaptation of liquidity strategies does not have significance on ROA. Working capital ratio is the most commonly used liquidity measurement. More frequent monitoring and forecasting on liquidity levels and making more short term investment can provide gains in profitability. The study concluded that the adjustment

of liquidity practice is beneficial for the companies even though, benefits are not always directly measurable as profitability.

Nazir and Afza (2008) used external and internal factors to explore the determinants of working capital requirements of a firm. Internal factors are operating cycle, operating cash flows, leverage, size, Return on Assets (ROA). Tobin's and growth while industry dummy and level of economic activity are external macroeconomic factors. Their findings revealed that operating cycle, leverage, return on assets (ROA) and Tobin's had an influence on the working capital requirements significantly. The study concludes that working capital management practices are also related to industry and different industries are following different working capital requirements.

Contrary to the above, Ganesan (2007) analyzed the liquidity components efficiency on telecommunication equipment industry in India and found a negative relationship between liquidity components and Return on Assets of the companies. However, the association between accounts payable period and return on assets was found to be insignificant.

Based on the above review, it was obvious that some studies uncovered a positive relation while others a negative relation.

### **2.7.2 Empirical Studies on Liquidity Management and Return on Equity**

Kurawa and Abubakar (2014) uncovered a positive relationship between Return on Equity and Cash and Bank balances to Total Liabilities, negative relationship between Return on Equity and Loan and Advances to Total Assets. The study concluded that there is no significant relationship between liquidity and profitability among the listed banking firms in Nigeria.

Ajanthan (2013) investigated the relationship between liquidity and Return on Equity of all the trading companies in Sri Lanka for a period of five years (2008-2012). Regression and descriptive statistics were used and the study revealed a significant relationship between liquidity and Return on Equity (ROE).

Misbah, Khan, Ul-abrar, Jamil and Khalifa (2013) analyzed the impact of working capital management on the performance of manufacturing sectors by using different key measures which include the Average collection period, Inventory turnover in days, Average payment period, Cash conversion cycle, Current ratio, Debt ratio, Size of the firm and Financial assets to total assets on the Net operating profitability of the firms. The study found a significant negative relationship between net operating profitability and the average collection period, inventory turnover in days, average payment period, cash conversion cycle and debt used by the firm.

Owolabi and Obida (2012) measured the relationship between liquidity management and corporate profitability using data from selected manufacturing companies quoted on the floor of the Nigerian Stock Exchange. The result of the study was obtained using descriptive analysis and showed that liquidity management measured in terms of the companies Credit Policies, Cash Flow Management and Cash Conversion Cycle has significant impact on corporate profitability and it is concluded that managers can increase profitability by putting in place good credit policy, short cash conversion cycle and an effective cash flow management procedures.

Contrary to the above however, Taani (2012) uncovered a non significant impact of working capital management policy on return on equity (ROE).

The relationship between liquidity and profitability of oil and gas companies listed on Karachi Stock Exchange (KSE) Pakistan was examined by Saleem and Rehman (2011) using a

population of 26 oil and gas companies. The result showed an insignificant impact of liquidity management on ROE and ROI.

In the same vein, Ahmed (2010) investigated the impact of working capital management on the performance of the firm using a sample of 253 non financial listed companies of Karachi Stock Exchange (KSE), Pakistan. The study used secondary data taken from Balance Sheet Analysis of Stock Listed Companies on KSE published by State Bank of Pakistan. Results were analyzed by using the Logistic Regression, OLS Regression and Pearson Correlation techniques. The result suggested that out of the five selected components of working capital management only current asset over total sales showed significant negative relationship with both the proxies of performance i.e. return on equity and return on assets. While Current Asset over Total Asset (CATA), inventory turnover and current ratio showed significant positive relationship with performance. Logistic regression results suggested that probability of firm being in profit is highly determined by CATA, CATS and CR.

Garcia-Teruel and Martinez-Solano (2007) studied the effects of working capital management on the profitability of small and medium-sized Spanish firms. The findings revealed a positive relation between working capital management and profitability and the study recommended that managers can create value by reducing their inventories and the number of days for which their accounts are outstanding. Moreover, shortening the Cash Conversion Cycle also improves the firm's profitability.

Ganesan (2007) analyzed the working capital management (WCM) efficiency on the telecommunication equipment industry in India. Unlike other researchers, he did not include cash conversion cycle as a component of WCM. Applying ROA as a measure of company

profitability for a sample of 349 publicly listed companies, he found a negative relationship between WCM components and ROA of the companies. However, the association between accounts payable period and profitability was found to be insignificant.

Similarly, Vishnani and Shah (2007) examined the relationship between WCM and profitability by employing 14 listed companies of the Indian consumer electronics industry between 1994/5 and 2004/5. The findings revealed a positive effect of raw material inventory holding period and accounts payable period on companies ROCE. On the other hand accounts receivable period and Cash Conversion Cycle was found to be negatively related to ROCE. This led to the conclusion that creditors' management policy plays an important role in companies' profitability.

Based on the above reviewed literatures, it can be said that most of the existing studies on liquidity management and Return on equity revealed positive relation.

### **2.7.3 Empirical Studies on Liquidity and Profitability**

Egbide, Uwigbe and Uwalomwa (2013) investigated the relationship between liquidity and profitability using a sample of 30 manufacturing companies listed on the Nigeria Stock Exchange for the period 2006-2010. The study revealed that current ratio and liquid ratio are positively associated with profitability while cash conversion period is negatively related with profitability of manufacturing companies in Nigeria. The associations in all the cases were statistically insignificant, indicating low degree of influence of liquidity on the profitability of manufacturing companies. The study recommended that the overall state of liquidity should be improved by establishing more realistic credit policy which would engender shorter Cash Conversion Period (CCP), hence have a favorable impact on the profitability of the company.

Similarly, Ibi (2013) investigated the impact of liquidity management on the profitability of banks in Nigeria using three banks randomly selected to represent the entire banking industry in Nigeria. The study used cash and short term fund, bank balances and treasury bills and certificates as proxies for liquidity management, while profit after tax was the proxy for profitability. The result revealed that liquidity management is indeed a crucial problem in the Nigerian banking industry. The study therefore recommends that banks should engage competent and qualified personnel in order to ensure that right decisions are adopted especially with the optimal level of liquidity and still maximize profit.

Rajdev (2013) evaluated the impact of working capital management on profitability, Statistical techniques were used in analyzing the data. The finding suggests that, the liquidity is managed by owners past experience and hence, there is no significant correlation between liquidity and profitability. The study concluded that liquidity management is a pre-requisite for the very survival of the concern.

Niresh (2012) conducted a study on trade off between liquidity and profitability using correlation analysis and descriptive statistics. The study covered 31 manufacturing firms out of 39 listed in the Colombo Stock Exchange (CSE). They found that, there is no significant relationship between liquidity and profitability and concluded that manufacturing firms should concentrate on maximizing profit while preserving liquidity.

Uremadu (2012) analyzed the relationship between corporate capital structure and the profitability using banks quoted on the Nigerian stock exchange and the study applied Auto Regressive Distributed Lag (ADL) model. The paper used the secondary data of banks for 27 years 1980 – 2008. The study revealed a positive influence of Cash reserve ratio; liquidity ratio,

and corporate income tax, and a negative influence of bank credits to the domestic economy, savings deposit rate, gross national savings, and balances with the central banks, inflation rate and foreign private investment on banking system profits in Nigeria. The study concluded that profitability and liquidity of banks depends on four core variables: liquidity ratio, balances with the central banks, savings ratio, and cumulative foreign.

Saghir et al (2011) examined the relationship between working capital management and profitability of 60 textile firms listed on Karachi stock exchange for a period of 5 years from 2001-2006. The study applied Pearson correlation and ANOVA; the findings revealed a significant negative relationship between cash conversion cycle and profitability. The study concluded that a firm with longer account receivable and payable in days will be less profitable.

Mojtahedzadeh et al. (2011) conducted a study on the relationship of WCM and profitability using 101 non-financial firms during the period of 2004-2008 listed on Tehran Stock Exchange using Pearson Correlation and Multivariate Regression Analysis. The findings showed a negative relationship between cash conversion cycle, A/R in days and A/P in days with profitability. The study concluded that Average Period of inventory retention has no significant relationship on Profitability.

Dong and Su (2010) examined working capital management effects on firms' profitability of listed Vietnamese firms from 2006-2008. The study revealed a significant negative relationship between profitability, measured as gross operating profit and the components of cash conversion cycle (inventory days, and receivable days). Furthermore, the study observed a significant positive association between profitability and accounts payable days. These findings imply that

increasing firms' inventory and receivable days lead to a decreasing profit while significant financial success can be attained with increased payable days.

Bordeleau and Graham (2010) evaluated the impact of liquid assets holding on bank profitability for a panel of Canadian and U.S Banks over the period of 13 years 1997 – 2009. Econometric framework is presented in the study. Result suggested that profitability is improved for banks that hold some liquid assets, however, there is a point at which holding further liquid assets diminishes a bank's profitability. Moreover, empirical evidence suggested that this relationship varies depending on a bank's business model and the state of the economy. Therefore firms should maintain a balance between liquidity and profitability in its day to day operation.

Guimaraes and Nossa (2010) investigated working capital, profitability, liquidity and solvency using descriptive statistic on 621 non financial firms for 2001, 2002 and 2004 on the Analysis of Variance Result (ANOVA). The authors found that, where financial current assets exceed current liabilities, and cyclical current assets exceed cyclical current liabilities – is associated with high levels of profitability, liquidity and solvency. In addition, the study emphasized the “importance of efficient management of working capital to the performance and survival of those non financial firms.

Chatterjee (2010) assessed the relationship between working capital management practices and the profitability of listed firms on the London Stock Exchange. Using a sample of 30 UK firms and employing the Pearson correlation data analysis technique, the study found a significant negative association between profitability and working capital management variables. Specifically, the study observed a significant negative relationship between profitability and liquidity and also significant negative relationship between total debt and profitability. The study

further found a significant positive association between profitability and firm size. The implication is that, profitability of firms increase when they improve upon their working capital management. Particularly, holding highly liquid assets is important as it significantly enhances firms' profitability. This is because assets can easily and quickly be sold off and the revenue re-invested in other relatively higher short-term assets and coupled with the fact that it also prevents court actions and its associated cost emanating from the firm's inability to pay its short-term creditors, the findings further implied that a high level of debt used is unhealthy for the financial success of the firm.

Gill et al. (2010) also studied the relationship between working capital management and profitability of 88 US firms listed on the New York Stock Exchange. Using data from 2005-2007, the authors found no statistically significant relationship between average payable days and profitability and also between averages inventory days and firm profitability. Similarly, they also observed no significant relationship between firm size and profitability but noticed a negative association between accounts receivable and profitability. This suggests that managers can enhance the profitability of their firms by reducing the number of days for their account receivables. In a related study, Karaduman et al. (2010) investigated the impact of working capital management practices on the profitability of 140 randomly selected companies listed on the Istanbul Stock Exchange. Using data from 2005-2008, their findings indicated a significant negative association between firm profitability, measured as return on assets on one hand and accounts receivable and inventory days on the other hand. The study further revealed a significant positive relationship between accounts payable days and firm profitability. Thus, the study has reiterated the importance of effective and efficient working capital management in ensuring firms' profitability.

Mathuva (2010) examined the influence of working capital management components on corporate profitability. Employing a sample of 30 companies listed on the Nairobi Stock Exchange (NSE) for the period of 1993 to 2008, and excising both pooled OLS and FE regression models, found that there exists a highly significant positive relationship between the time taken to convert inventory into sales and profitability. It was concluded that maintaining high inventory levels reduces the costs of possible interruptions in the production process and the loss of business due to scarcity of resources. The negative relationship between the cash conversion cycle and profitability was explained to mean that minimizing the investment in current assets can help in boosting profitability, by ensuring that liquid cash is not maintained in the business for too long and that it is used to generate profit for the company.

Ramachandran and Janakiraman (2009) conducted a study on WCM efficiency and company profitability of paper industry in India during the period between 1997 to 2006. By employing a sample of 30 companies listed on the Bombay Stock Exchange, inventory holding period and cash conversion cycle were found to be negative and significantly related with profitability. It was therefore suggested that less profitable companies will pursue a decrease of their accounts receivable period in an attempt to reduce their cash gap in the cash conversion cycle. Accounts receivable period and accounts payable period on the other hand were found to be positively related to profitability, which led to the conclusion that a more profitable company delays its payment to its suppliers.

Afza and Nazir (2009) investigated the relationship between working capital management policies and a firm's profitability for a sample of 204 non-financial firms listed on the Karachi Stock Exchange (KSE). Using regression analysis technique and data from 1998-2005, the study

found a significant negative relationship between the profitability of firms and degree of aggressiveness of working capital investment and financing policies. The study further indicated a significant difference among the working capital requirements and financing policies across different industries. The study suggested that managers can create value if they adopt a conservative approach towards working capital investment and working capital financing policies.

In a similar vein, Falope and Ajilore (2009) examined the effects of working capital management on the profitability of 50 quoted non-financial Nigerian firms. Using panel data methodology and data from 1996-2005, the authors observed a significant negative relationship between net operating profit and working capital management variables, namely: average collection period, inventory days, and cash conversion cycle. However, the study noticed no significant variations in the effects of working capital management between large and small firms. An important lesson therefore is that, prudent working capital management is critical for the profitability of firms of all sizes.

Raheman and Nasr (2007) conducted a study on the effect of different variables of working capital management including average collection and inventory days, cash conversion cycle, and current ratio on the net operating profitability of 94 listed Pakistani firms. Using regression analysis and data covering the period from 1999-2004, the study found a significant negative association between working capital management variables and profitability of the firms. The study further revealed a significant negative relationship between corporate debt and profitability but a significant positive association between size and profitability. The implications of these

findings are that prudent management of working capital, reasonable levels of debt used and increase sales are all very crucial in enhancing the profitability of the modern firm.

Lazaridis and Tryfonidis (2006) examined the relationship between profitability and working capital management of 131 firms listed on the Athens Stock Exchange. Using regression estimation approach and data covering the period from 2001-2004, they found a significant inverse relationship between profitability, measured as gross operating profit and the cash conversion cycle, accounts receivables days and inventory days. They also observed a significant positive association between profitability and accounts payable days. This study re-emphasized that, firms can enhance profitability by prudently keeping their working capital management components (accounts receivables, accounts payables, and inventory) within optimal levels.

In another study, Eljelly (2004) examined the relationship between profitability and working capital management on a sample of 929 Saudi firms spread across three industries. The study found a significant negative relationship between the firms' profitability and liquidity level measured by current ratio and cash conversion cycle. The study further observed variations in the cash conversion cycle among the industries used in the study, therefore concluded that short cash conversion cycle and large firm size is associated with enhance profitability.

In summary, the literature reviewed indicates that previous studies on working capital management and profitability of the firm revealed mixed results, therefore considering the methodological introduced in this study, it is expected that the results may be improved.

#### **2.7.4 Control Variables and Pofitability**

The relationship between control variables and profitability are reviewed below:

For example, Mathuva (2010) employed financial leverage, company age, company size as control variables in establishing the influence of WCM components on corporate profitability. The results showed a negative association between financial leverage and profitability. However, a positive relationship was postulated between company size, company age and profitability. Samiloglu and Demirgunes (2008) introduced company size and financial leverage as control variables when they investigated the effect of WCM on firm profitability in Turkey. The results indicated a positive and negative association between company size and financial leverage with profitability respectively.

## **2.8 Theoretical Framework**

There are various theories with regard to liquidity management and profitability:

### **2.8.1 Pecking Order theory**

Pecking order theory tries to capture the cost of asymmetric information and states that companies prioritize their sources of financing (from internal financing to equity) according to the law of least effort, or of least resistance preferring to raise equity as a financing means of 'last resort'. This implies that internal financing is used first; when it is depleted, then debt is issued and when it is no longer sensible to issue more debt, equity is issued. The theory maintains that businesses adhere to a hierarchy of financing sources and prefer internal financing when available, and debt is preferred over equity if external financing is required (equity implies issuing more shares which meant bring external ownership into the firm). Thus the form of debt a firm chooses can act as a signal of its need for external financing. The pecking order theory is popularized by Myers (1984) when he argues that equity is less preferred means to raise capital because when managers (who are assumed to know better about the condition of the firm

than investors) issue new equity, investors believe that managers think that the firm is overvalued and managers are taking advantage of this over valuation. As a result investors will place a lower value to the new equity issuance. The conclusion of Myers and Majluf is that the market will attach no significance to issuance of new equity resulting in the circumvention by owners by taking recourse to internal financing. Further, in a situation where external financing is essential, debt is perceived by the firm to be safer than equity since the market value does not change much over time.

Prior empirical studies buttress this. The Titman and Wessels (1985) study shows that more profitable firms will tend to use less external financing thus providing support for pecking order theory (Caopeland, 1988:519), Event studies show that equity issue is interpreted as bad news by the market, with significantly negative announcement date effects on equity prices. Masults and Korwar (1986), Asquith and Mullins (1986), Kolodny and Suhler (1985) and Mikkelson and Patch(1986). This is consistent with Pecking order theory. A determinant of cash holding from the perspective of pecking order theory has been supported by other researches. Sebastian (2010) examine liquidity and solvency and finds that corporate liquidity and solvency interact through information, hedging, and leverage channels. The information and hedging channels increase equity-value of firms which helps to pay regular dividend and most importantly reduce volatility in cash flow. Frank & Goyel (2002) showed that larger firms are more organized to take decision followed by this theory. Smaller firms were not following this theory and as the smaller firms moved away from pecking order theory so, overall average moves further from the pecking order (owolabi; 2004). Soku (2008) while testing financial flexibility and capital structure of small, medium and large firms observed that, large mature firms prefer using internal funds and safe debt in order to recharge financial flexibility rather than issuing equity.

In case of small firms though they have low leverage, in order to cope with lack of cash at hand, they prefer to issue equity and increase cash holdings. However he ends up with Financial flexibility hypothesis which refers firms hold cash and expect future cash flow, and that characterize their future investment plan and current ability to sort out financial constraints.

### **2.8.2 Trade off Theory of Liquidity**

Under perfect capital market assumptions holding cash neither creates nor destroys value. The firm can always raise funds from capital markets when funds are needed, there are no transaction costs in raising these funds, and the funds can always be raised at a fair price because the capital markets are assumed to be fully informed about the prospects of the firm. The trade-off theory suggests that firms target an optimal level of liquidity to balance the benefit and cost of holding cash. The cost of holding cash includes low rate of return of these assets because of liquidity premium and possibly tax disadvantage. The benefits of holding cash are in twofold: First the firms save transaction costs to raise funds and do not need to liquidate assets to make payments. Secondly the firm can use liquid assets to finance its activities and investment if other sources of funding are not available or are extremely expensive. As theory, the use of trade off model cannot be ignored, as it explains that, firms with high leverage attracts high cost of servicing the debt thereby affecting its profitability and it becomes difficult for them to raise funds through other sources (Jensen, 1986).

### **2.8.3 Financing Theory**

This theory predicts a positive association between accounts receivable period and profitability because suppliers assume the position of financial institutions and therefore extend finance to customers in the form of higher credit sales. The financing theory sees the granting of credit purely on financial grounds, therefore viewing trade credit as a substitute for institutional

financing (Bhattacharya 2008). Many reasons account for why companies divert from their core business to give credit to their customers. The first argument is that suppliers have several advantages over financial institutions (Freixas 1993; Jain 2001). Suppliers are able to reduce the information asymmetry between the customer and themselves, thereby reducing the rate of default. Because of the constant and continuous trading relationship, suppliers are in the best position to better evaluate the credit worthiness of their customers (Jain 2001 and Van Der Wijst 2002). They are also in better position to monitor their customers than financial institutions because of the frequent trade transactions. The second argument is that suppliers have more effective and quicker ways to collect and sell assets of defaulting customers, especially, in the case of durable goods, it is easier to repossess and resell. Another argument of the financing theory is that the increase in accounts receivable period leads to greater control over customers. This is because a supplier can threaten to cut-off supplies should the customer default in paying. According to Garcia-Teruel and Martinez-Solano (2010b), the control over customer becomes even more important when there are few suppliers in the market. Because in this instance, customers will be weary of a default due to lack of supplies from another source.

Kandori (1992) and McMillan and Woodruff (1999) contended that the control even becomes more stronger if the supplier is a member of a network that sanctions can be made by the group as a whole. The financial theory of accounts receivable may improve companies' profitability because it will forge a good supplier-customer relationship. A good supplier-customer relationship may enhance profitability because it guarantees future sales. Also, it will lead to increase in profitability because it will entice customers to purchase more.

#### **2.8.4 Transaction Costs Theory**

As argued by Emery (1987), the transaction cost motive for extending trade credit is motivated purely by the desire to enhance operating flexibility, which may encourage higher profitability. According to the transaction cost theory, companies indulge in trade credit in order to reduce the cost of transactions between them, which may lead to increase in profitability (Petersen and Rajan 1997; Nelson 2002; Banerjee et al. 2007; Bhattacharya 2008). Without trade credit, companies would be required to make payment on the delivery of goods and services. By agreeing on the terms of payment a company is able to separate its purchases cycle from the payment cycle. This helps to avoid the situation whereby companies may have to always make arrangement to pay immediately for the purchases of goods and services. Even though immediate payment upon purchases will be wise in case of periodical transactions, in situations whereby the transactions between a seller and a buyer are frequent, the cost involved can be substantial. By separating purchases from payment and also agreeing to a fixed payment period, a company can plan and manage its financial resources with certainty (Schwartz 1974). In the absence of trade credit, companies may be forced to keep large sums of money as a precaution to settle payments against an unexpected or sudden demand for products. Stowe and Gehr (1985) argue that the separation of payment from delivery reduces monetary theft risk and therefore leads to improvements in profitability.

From the foregoing therefore, it is obvious that the various theories with regards to liquidity and profitability have explained how the liquidity management enhances operational efficiencies which may encourage higher profitability. The theoretical assumption of this research relies on the financing theory because it has a link or supports this work by showing that

managing account receivable which is a component of liquidity management, May improves company's profitability.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter presents various methods that were used by the research for the purpose of carrying out this study. It specifically explained the research design, population of the study, sample size, sampling techniques, sources and methods of data collection, variables of the study and their measurement and methods of data analysis.

#### **3.2 Research Design**

This study adopted ex-post facto research design using panel data for the periods under study (2004 – 2013) because the study entails the use of annual report and accounts of the quoted Nigerian food products companies under study. This is in view of its relative importance to the actualization of the research objective which is to determine the relationship between liquidity management and profitability in the Nigerian food products industry.

#### **3.3 Population of the Study**

This study intends to use all the food product companies that are quoted on the Nigeria Stock Exchange as at 2014 as population of the study. This is because the study is concerned with studying listed food product companies in Nigeria. There are eleven (11) food products companies quoted on Nigerian Stock Exchange as contained in table 3.1 below.

**Table 3.1: Food Products Companies in Nigeria**

<b>S/No</b>	<b>Name of company</b>	<b>Year of incorporation</b>	<b>Year of listing</b>
1.	Big treat PLC	1991	2007
2.	Dangote Flour Mills PLC	2006	2008
3.	Dangote Sugar Refinery PLC	2005	2007
4.	Flour Mills of Nigeria PLC	1960	1979
5.	Honeywell Flour Mills PLC	1995	2008
6.	Multi – Trex Integrated foods PLC	1999	2010
7.	Northern Nigeria Flour Mills PLC	1971	1978
8.	National Salt Company of Nigeria PLC	1973	1992
9.	PS Mandrides PLC	1949	1979
10.	UTC Nigeria PLC	1969	1972
11.	Union Dicon Salt PLC	1992	1993

Source: Generated by the Researcher from the NSE Fact Book (2013).

### **3.4 Sampling Techniques and Sample Size**

The sampling technique employed in this study is the non - probability sampling technique of judgmental sampling base on the filter that; for any company to be included in the sample, it must satisfy the following criteria. First, a company must have been listed on the NSE on or before 31<sup>st</sup> December, 2004. Second, the company must not have been delisted between 2004 and 2013. These criteria are established with a view to ensure that the food products companies have their published financial statements for the period covered by this study. Using this filter

and considering the date of listing of the companies in Table 3.1, the number of food products companies will reduce to six and this will serve as sample of the study.

**Table 3.2: List of Sampled Companies**

S/No	Name of company	Year of incorporation	Year of listing
1.	Flour Mills of Nigeria PLC	1960	1979
2.	Northern Nigeria Flour Mills PLC	1971	1978
3.	National Salt Company of Nigeria PLC	1973	1992
4.	PS Mandrides PLC	1949	1979
5.	UTC Nigeria PLC	1969	1972
6.	Union Dicon Salt PLC	1992	1993

Source: Generated by the Researcher from the Table 3.1

### **3.5 Sources and Methods of Data Collection**

The choice of source of data for a study depends solely on the variables being examined. As the study seeks to examine the relationship between liquidity variables and profitability of food product companies, the required data were extracted from the published annual reports and accounts of the six food products companies under study covering a period of ten years (2004 – 2013). This method of data collection was adopted because it suits the research designs for this study.

### **3.6 The Variables of the Study and Their Measurement**

For the purpose of achieving the objective of this study, three category of variables were employed. These are: i. Liquidity management variables (independent variables) ii. Profitability variables (dependent variables) and iii. Control variables. Proxy for liquidity management is cash

conversion cycle. Also, proxies for profitability are: return on assets and return on equity. However, firm size, growth and financial leverage were used as control variables for the study. However, to remain consistent with previous studies, measures pertaining to Liquidity management and profitability were taken from Lazaridis and Tryfonidis's (2002); Deloof (2003); (Yafee, 2003) and subsequent work of Padachi (2006). These variables are explained below:

### **3.6.1 The Dependent Variable**

This study used profitability as dependent variable and the following proxies will be used to measure profitability.

#### **(a) Return on Assets (ROA)**

The Return on Assets (ROA) expresses the net income earned by a company as a percentage of the total assets available for use by that company Owolabi (2012). ROA suggests that companies with higher amounts of assets should be able to earn higher levels of income. It measures management's ability to earn a return on the firm's resources (assets) and it is obtained by dividing profit after tax by total assets. It is adopted for this study because it shows how effectively and efficiently a firm utilizes the resources (assets) at its disposal in revenue generation. In other words, it is an indication of an organization's operating efficiency. This is consistent with the work of (Owolabi and Obida 2012; Anojan 2014).

#### **(b) Return on Equity (ROE)**

The net profit after tax represents the shareholders' return. A return on shareholder's equity is calculated to see the profitability of owners' investment. The shareholders' equity or net worth will include paid up share capital, share premium and reserves. Net worth can also be found by

subtracting total liabilities from the total assets. The ROE is net profit after taxes divided by shareholders' equity which is given by net worth. This is consistent with the work of Lazaridis and Tryfonidis (2002); Deloof (2003); (Yafee, 2003) and subsequent work of Padachi (2006) (Teruel & Solano, 2007) (Samiloğlu & Demirgüneş, 2008; Nazir & Afza, 2009; Zariyawati, et al., 2009; Azhar & Noriza, 2010; Vijayakumar, 2011).

### **3.6.2 The Independent Variable**

The Cash Conversion Cycle (CCC) used as a comprehensive measure of liquidity is independent variable, and is measured by adding Account Receivable Period (ARP) to Inventory Conversion Period (ICP) and then subtracting the Account Payable Period (APP). It is expected that there is a negative relationship between profitability and cash conversion cycle, this is with the view that the time lag between expenditure for the purchase of raw materials and the collection of sales of finished goods can be too long, and that decreasing the time lag increases profitability. This is consistent with the study of (Wang, 2002; Deloof, 2003; Lazaridis & Tryfonidis, 2006; Samiloğlu & Demirgüneş, 2008; Caballero et al., 2009; Vijayakumar, 2011).

### **3.6.3 Control Variable**

Along with cash conversion cycle, the present study has taken into considerations some control variables relating to firms such as the size of the firm, the growth in its sales and its financial leverage.

#### **(a) Firm Size**

The size of the firm (SIZE) will be measured by the natural logarithm of its total sales. Such control is necessary because larger firms should have a lower risk of bankruptcy and therefore, a greater ability to operate in the foreseeable future. This is consistent with the work of Padachi (2006).

### **(b) Growth of the Firm**

The growth of the firm (GROWTH) is measured by variations in its annual sales value with reference to previous year's sales ( $\frac{\text{previous sales} - \text{current sales}}{\text{current sales}}$ ). This control is necessary because companies with higher growth rate are expected to be more profitable.

### **(c) Financial Leverage**

Moreover, the financial leverage (LEV) was taken as the debt to equity ratio of each firm for the whole sample period; this is because companies that are over-leveraged must take steps to reduce the gap between their cash on hand and their debt obligations. Meaning they are expected to be more liquid by the debt holders which may likely affect the company's profitability as ideal cash are kept.

## **3.7 Technique of Data Analysis**

The choice of appropriate statistical technique to be used in any research work remains a function of the data to be measured. Given the objective of the study and following the works of Raheman, Afzan, Qayyum and Bodla, (2010); Gill, Biger and Mathur, (2010); Aliprdua and Mohan, (2012); Ali, (2012); Owolabi and Alu, (2012); Shukula (2012); Rehn, (2012); Chaklader and Shrivastava, (2013); Taani, (2012); Oladipupo and Okafor, (2013); Langroudi, Biabani and Somesaraei, (2013); and Toby (2014). A panel data analysis was employed because both cross-sectional and time series data was treated simultaneously. Stata Version12.0 was used for the analysis.

### **3.7.1 Descriptive Statistics**

Descriptive statistics were used to compute the summary of statistics that will describe the central tendency, as well as, how the data spread out around this value. This tool is used to describe the dependent and independent variables of the study by computing the Mean, Median, Maximum, Minimum and Standard Deviation of the variables. This is consistent with the study of Gill, Biger and Mathur, (2010); Aliprdua and Mohan, (2012); Ali, (2012); Owolabi and Alu, (2012); Shukula (2012); Rehn, (2012); Chaklader and Shrivastava, (2013); Taani, (2012); Oladipupo and Okafor, (2013); Langroudi, Biabani and Somesaraei, (2013).

### **3.7.2 Correlation**

Pearson correlation technique was used to establish the nature of the relationship between liquidity and profitability. This will show the strength of the relationship between the independent variables among themselves and the dependent variable. This is consistent with the study of Gill, Biger and Mathur, (2010); Aliprdua and Mohan, (2012); Ali, (2012); Owolabi and Alu, (2012); Shukula (2012); Rehn, (2012); Chaklader and Shrivastava, (2013); Taani, (2012); Oladipupo and Okafor, (2013); Langroudi, Biabani and Somesaraei, (2013).

### **3.7.3 Multiple Regressions**

In order to determine the variation in dependent variable, (Return on Assets (ROA)) due to variation in the independent variables (Cash Conversion Cycle (CCC) ) multiple regression was employed. This is because multiple regressions are expected to explain the variation in dependent variable due to the variation in any of the independent variables. The regression analysis was used to test the formulation hypothesis. All the analysis was done with the aid of stata version 12.

### **3.7.4 Robustness Test of Independent and Dependent Variables**

The robustness test was conducted in order to improve the validity of all statistical inferences for the study. The tests include Multicollinearity, Breusch-pagan for heteroskedasticity, Hausman specification test. These are discussed below:

**i. Multi-collinearity Test**

Statistically, multi-collinearity is a situation where two or more predictor variables are themselves highly correlated. High correlation among predictor variables can affect the predictive power of the independent variables which can also be harmful for the regression analysis. In order to test for the presence or otherwise of multi-collinearity, Variance Inflation Factor (VIF) test was conducted on the predictor (independent) variables.

ii. **Test of Heteroskedasticity** ensures that the regression fits all the values of the independent variables and this is possible only if the residuals do not vary with independent variable and therefore are random in nature. A p- value of less than 5% indicates the presence of heteroskedasticity, while a p- value of greater than 5% indicates the presence of homoskedasticity.

**iii. Hausman Specification Test:**

The hausman test was carried out to decide the Fixed Effect and the Random Effect. This was conducted to choose between the Fixed Effect and the Random Effect to represent the data in order for the study to arrive at a valid inference. Fixed Effect Model (FEM) takes into consideration the individuality of each firm or cross sectional unit included in the sample by allowing the intercept to vary for each firm while assuming that the slope coefficients are constant across firms and the Random Effect Model (REM) assume that the individual or group effects are uncorrelated with other explanatory variables. Therefore, a p-value of greater than 5% indicates that random effect is appropriate.

### 3.7.5 Model Specification

The general model based on the variables of the study which is a modification of Raheman, Afzan, Qayyum and Bodla, (2010); Gill, Biger and Mathur, (2010); Aliprdua and Mohan, (2012); Ali, (2012); Owolabi and Alu, (2012); Shukula (2012); Rehn, (2012); Chaklader and Shrivastava, (2013); Taani, (2012); Oladipupo and Okafor, (2013); Langroudi, Biabani and Somesaraei, (2013) and Toby (2014) which is given as follows:

$$LM = CCC = f( ICP + ARP - CPP ) \dots\dots\dots \text{(equation 1)}$$

$$ROA_{it} = \alpha + \beta_1 CCC_{it} + \beta_2 SIZE_{it} + \beta_3 GROW_{it} + \varepsilon \dots\dots\dots \text{(equation 2)}$$

$$ROE_{it} = \alpha + \beta_1 CCC_{it} + \beta_2 SIZE_{it} + \beta_3 GROW_{it} + \varepsilon \dots\dots\dots \text{(equation 3)}$$

Where;

LM is Liquidity Management

ROA is Return on Assets

ROE is Return on Equity.

CCC is Cash Conversion Circle

ARP is Account Receivable Period

CPP is Creditors Payment Period

ICP is Inventory Conversion Period

$\alpha$  is the Constant Term

$\beta$  is the Regression Coefficient

## **CHAPTER FOUR**

### **DATA PRESENTATION, ANALYSIS AND DISCUSSION**

#### **4.1 Introduction**

This chapter presents the analyses and interpretation of the data generated quantitatively from the annual reports of the studied food products companies listed on the Nigerian Stock Exchange for a period of ten (10) years (2004 – 2013). This is to determine the impact of the independent variables on the dependent variable. The chapter explains the preliminary analysis of the sample using descriptive statistics, correlation and then the regression result of the dependent variable (ROA and ROE) and the independent variable (cash conversion circle, size, growth and leverage). The robustness tests carried-out are also presented.

#### **4.2 Analysis of Data**

This section presents the results of the analysis conducted on the data collected from the annual reports. The descriptive statistics, correlation and regression results are presented in the subsequent sub sections.

##### **4.2.1 Descriptive Statistics**

Table 4.2 provides summary of statistics for the variables of the study, such as mean, the standard deviation, minimum and maximum of both the dependent variable and explanatory variables. The table shows the summary statistics of the dependent and independent variables in order to effectively appreciate the nature of the results. The descriptive statistics analyzes the basic feature of liquidity management and financial performance. It provides a basic insight into the nature of the data upon which analysis is done.

**Table 4.2 Descriptive Statistics of the Variables**

<b>Variables</b>	<b>Obs.</b>	<b>Mean</b>	<b>StdDev.</b>	<b>Min</b>	<b>Max</b>
ROA	60	0.0041862	0.3334117	-1.2729	0.7438
ROE	60	1.856081	8.170346	-4.1507	62.863
CCC	60	56.70589	119.3105	-592.33	303.4344
RCP	60	34.09158	42.84065	0	223.352
ICP	60	99.04015	98.57883	0	481.579
CPP	60	76.42583	133.4067	8.213	902.185
Size	60	9.058119	0.7988227	6.6118	10.7079
Growth	60	0.5846117	2.185336	0	17.095
Leverage	60	1.166265	8.455449	0	65.5540

**Source:** Generated by the Author from the Annual Reports and Accounts of the sampled firms

Table 4.2 shows the mean of 0.0042 for ROA meaning that the average return on asset of the listed food product companies in Nigeria is approximately 0.4% with the minimum and maximum of -1.2729 and 0.7438 respectively. The mean of ROE is 1.856081 meaning that the average return on equity of the listed food product companies in Nigeria is approximately 1.86. Cash conversion circle has a mean 56.70589 meaning that on average the listed food product companies in Nigeria convert raw material to cash within 57 days. Receivable collection period has a mean of 34.09158 with minimum and maximum of 0 and 223.352 respectively, meaning that on average the listed food products companies in Nigeria collect cash from debtors within 34 days after sales. Inventory conversion period has a mean of 99.04015 with a minimum and maximum of 0 and 481.579 respectively, meaning that on average the listed food product companies in Nigeria convert stocks to sales within 99 days. Creditor's payment period has a mean of 76.42583 with minimum and maximum of 8.213 and 902.185 respectively meaning that on average the listed food product companies in Nigeria paid cash to their suppliers within 76 days.

Size, measured by the natural logarithm of total assets has a mean of 9.058119, with the minimum and maximum of 6.6118 and 10.7079 respectively. Growth, measured by the

difference between previous and current sales divided by current sales has a mean of 0.5846117, with the minimum and maximum of 0 and 17.095 respectively while leverage, measured as total debt divided by total assets has a mean of 1.166265 with the minimum and maximum of 0 and 65.554 respectively.

#### 4.2.2 Correlation Matrix

The correlation coefficients of the dependent variables (ROA and ROE), independent variables (CCC) and control variables (Firm Size, Growth and Leverage) are presented in Table 4.2. The correlation matrix table shows the relationship between all pairs of variables in the regression model; the relationship between all explanatory variables individually with explained variable and the relationship between all the independent variables themselves.

**Table 4.3 Correlation Result of the Dependant and Independent Variables**

Variables	ROA	ROE	CCC	ICP	RCP	CPP	Size	Growth	Lev	Vif
Roa	1.000									
Roe	0.142	1.000								
Ccc	0.161	0.299	1.000							1.06
Icp	0.163	0.267	0.585	1.000						1.06
Rcp	0.143	0.034	-0.392	0.209	1.000					1.06
Cpp	0.022	-0.060	-0.588	0.283	0.826	1.000				1.06
Size	0.523	0.342	0.0762	-0.049	0.0135	-0.099	1.000			1.04
Growth	0.014	-0.014	0.0203	0.0164	-0.029	-0.016	0.052	1.000		1.00
Lev	-0.039	-0.036	0.212	0.235	-0.095	-0.047	-0.163	0.021	1.000	1.08

*Source:* Generated by the Author from the Annual Report Data of the food product companies.

Table 4.3 shows the correlation coefficients of the dependent variables (ROA and ROE) and the independent variables (Cash Conversion Circle, size, growth and leverage). The values of the correlation coefficient range from -1 to 1. The correlation results presented in table 4.3 indicate

that three of the explanatory variables comprising of cash conversion circle, size and growth are positively correlated with the Return on assets, and leverage is negatively correlated with ROA. While Cash conversion circle and size are positively correlated with ROE, but growth and leverage are negatively correlated with ROE. And Variance Inflation Factor (VIF) test results provide evidence of the absence of collinearity. This is because the results of the VIF test ranges from a minimum of 1.00 to a maximum of 1.08 VIF of 5.00 can still be a proof of absence of collinearity (Doane & Steward 2007, Muhammad 2009, Barde 2009 cited in Samaila 2014). Hence, the predictive ability of the independent variables is not adversely affected by the relationship.

#### **4.2.3 Regression Analysis**

Regression results will be based on Ordinary Least Square (OLS) Robust and Random Effect (RE), Generalized Least Square (GLS) regression. The two results are presented together because of the presence of heteroskedasticity which led to the use of OLS Robust and the result of Hausman specification tests which favours the use of Random Effect GLS. The two regressions will be presented side by side for the two models but the analysis and interpretation will be made on the OLS Robust results.

#### **4.2.4 Robustness Test of Independent and Dependent Variables**

The robustness test was conducted in order to improve the validity of all statistical inferences for the study. The tests include Multicollinearity, Breusch-pagan for heteroskedasticity, Hausman specification test. These are discussed below:

##### **i. Multi-collinearity Test**

In order to test for the presence or otherwise of multi-collinearity, Variance Inflation Factor (VIF) test was conducted on the predictor (independent) variables. The result of the test shows a

mean VIF of 1.05 which is less than ten (10) which depicts absence of multi-collinearity (See appendix A and B).

**ii. Test of Heteroskedasticity**

The result of the heteroskedasticity test reveals that there is presence of heteroskedasticity in the first and second model because the probability of the chi square is 0.0000 in the first model and 0.0000 in the second model (See Appendix A and B). Therefore, this was corrected through the Robust ordinary least square (OLS) test.

**iii. Hausman Specification Test:**

The hausman test was carried out to decide the Fixed Effect and the Random Effect. Therefore, a p-value of greater than 5% indicates that random effect is appropriate. See Table 4.1 below:

**Table 4.4 Hausman Test**

	<b>P – value</b>	<b>Appropriate Method</b>
Model 1	0.9626	Random
Model 2	0.2169	Random

*Source: Generated by the author from Annual Report and accounts of the sampled firms (2004 – 2013) using stata version 12.0*

because the chi-square probabilities are (0.9626) and (0.2169) respectively. (See appendix A and B). However, the Hausman test indicates that random effect is the most appropriate to present the data for models 1 and 2.

**Model One (Impact of Cash Conversion Cycle on Return on Assets)**

Table 4.5 shows the regression results of Ordinary Least Square (OLS), Random Effects (RE) and Fixed Effects (FE). The dependent variable used in this model is the Return on Asset. Although the three results are shown, however, analysis and interpretation would only be made on the OLS and FE as the Hausman test suggests RE is more efficient.

**Table 4.5 Regression Result**  
**Random Effect Model**

	<b>Random Effect Model</b>				<b>Fixed Effect Model</b>			
ROA	Coef.	Std.err	Z	p>/z/	Coef.	Std.error	T	p>/z/
Constant	-1.41293	0.4893	-0.89	0.004	-1.2749	.5139788	-2.48	0.017
Ccc	.000305	0.0003	1.03	0.301	.000297	.000303	0.98	0.332
Size	.154834	0.0529	2.93	0.003	.13974	.056418	2.48	0.017
Growth	-.00233	0.0161	-0.15	0.884	-.00279	.0165053	-0.17	0.867
Lev	-.00114	0.0044	-0.26	0.794	-.00163	.0045092	-0.36	0.720
R-sqr:								
Within	0.1427				0.1430			
Between	0.6471				0.5476			
overall	0.2849				0.2818			
P-value	0.0278				0.0965			

**Source:** Generated by the Author from the Annual Report of the sampled firms from 2004 -2013.

The Random effect regression results displayed in table 4.3 revealed the cumulative R<sup>2</sup> (0.6471) within and (0.2849) overall which is the multiple coefficient of determination which gives the proportion or percentage of the total variation in the dependent variable explained by the explanatory variables jointly. Hence, it signifies that 28.49% of total variation in ROA of listed food product companies in Nigeria is accounted by the explanatory variables. Cash conversion circle has a positive relationship with ROA and the relationship is not statistically significant. Size is positively and statistically significant, while growth and leverage have negative relationship and is not statistically significant.

The regression results as shown in table 4.3 indicate a positive relationship between Cash conversion circle and ROA. This result is consistent with the findings of Lamberg and Valming (2009), Owolabi and Alu (2012), Kurawa and Abubakar (2012) and Toby (2014). However, the results contradict the findings of Taani (2012) who documented a positive and significant

relation between ROA and cash conversion circle, size and leverage and Ganesan (2007) who found a negative relationship between WCM components and ROA of the companies.

In view of the results reported of cash conversion circle, firm size, growth and leverage showing that all the variables excluding firm size have insignificant relation provides evidence for the acceptance of the first null hypothesis of the study which says that there is no significant relationship between ROA and liquidity management.

### Model Two (Impact of Cash Conversion Cycle on Return on Equity)

Table 4.6 shows the regression results of Ordinary Least Square (OLS), Random Effects (RE) and Fixed Effects (FE). The dependent variable used in this model is the Return on equity. Although the three results are shown, however, analysis and interpretation would only be made on the OLS and RE as the Hausman test suggests RE is more efficient.

The summary of the regression result obtained from the model of the study.

**Table 4.6 Regression Result**

	← Random effect model				Fixed effect model →			
ROE	Coef.	Std.err	Z	p>/z/	Coef.	Std.error	T	p>/z/
Constant	-28.2434	11.46367	-2.46	0.014	-29.435	14.76245	-1.99	0.052
Ccc	.01959	0.00853	2.30	0.022	0.01726	0.0087	1.98	0.053
Size	3.21436	1.264361	2.54	0.011	3.3703	1.6204	2.08	0.043
Growth	-0.1321	0.4531	-0.29	0.771	-0.3976	0.4706	-0.84	0.406
Lev	-.042897	0.12174	-0.35	0.725	0.1385	0.1295	0.11	0.915
R-sqr: Within	0.1542				0.1627			
Between	0.4673				0.3434			
overall	0.1952				0.1678			
P-value	0.0097				0.0597			

**Source:** Generated by the Author from the Annual Report Data of the sampled food product companies from 2004 – 2013.

The Random effect regression results displayed in table 4.3 revealed the cumulative  $R^2$  (0.4673) within and (0.1952) overall which is the multiple coefficient of determination which gives the proportion or percentage of the total variation in the dependent variable explained by the explanatory variables jointly. Hence, it signifies that 19.52% of total variation in ROE of listed food product companies in Nigeria is accounted by the explanatory variables. Cash conversion circle has a positive relationship with ROE and the relationship is statistically significant, size has a positive relation and the relationship is statistically significant. While growth and leverage have negative relationship with ROE and the relationship is not statistically significant.

The regression results as shown in table 4.3 indicate a positive relationship between Cash conversion circle and ROE. This results is consistent with the findings of Garcia-Teruel and Martinez-Solano (2007), Ahmed (2010), Owolabi and Obida (2012) and Ajanthan (2013) who found a significant relationship between liquidity and Return on Equity (ROE).

It is however, contrary to the findings of Saleem and Rehman (2011) who documented an insignificant impact of liquidity management on ROE and ROI, Taani (2012) who uncovered a non significant impact of working capital management policy on Return on Equity (ROE) and Misbah, Khan, Ul-abrar, Jamil and Khalifa (2013) who found a significant negative relationship between net operating profitability and the average collection period, inventory turnover in days, average payment period, cash conversion cycle and debt used by the firm.

In view of the results reported of cash conversion circle, firm size, growth and leverage showing that cash conversion circle and firm size has positive and significant relationship provides evidence for the rejection of hypothesis two of the study that there is no significant relationship between ROA and liquidity management in the Nigerian listed food products companies.

## CHAPTER FIVE

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 Introduction

This chapter presents the summary of the major findings of the study, the conclusions that are drawn there from and the recommendations that are proffered, with a view to bringing about improvement in liquidity management and profitability of listed Nigerian food product companies. The chapter comprised of three sections. Section one provides the summary; section two presents the conclusions and finally section three proffer recommendations on the conclusions of the study.

#### 5.2 Summary

The first chapter started with a background in which concerns have been expressed about the liquidity management and profitability. A number of studies have been conducted on liquidity and profitability at different times in developed, as well as developing countries, most of which are well documented in accounting and finance literature. These studies include that of Lamberg and Valming (2009); Bordeleau and Graham (2010); Renato (2010); Guimaraes and Nossa (2010); Saleem and Rehman (2011); Fathi, Hashemi, and Firuzkuhi (2011); Niresh(2012); Owolabi (2012); Uremadu (2012); Usama (2012); Alnimer, Warrad and Al Omari (2013); Agbada and Osuji (2013); lbe (2013); Zygmunt (2013) ; Victor and Antwil(2013); Andrew (2013); Naser , Mohammad , and Ma'someh (2013); Godfred (2013); Ifurueze (2013), Kurawa and Abubakar (2014).

Most of these studies used either Net Operating Profit or Return on Asset to measure profitability and concentrate on banking and manufacturing sectors covering a period of less than ten years, again as far as the impact of liquidity management on profitability of food products is concerned, there exists very few globally and in Nigeria particularly similar studies are limited in this sector

in the prior studies. In line with the problem statement, two research hypotheses were formulated in null form with a view to testing them at the end of the study. Finally, the first chapter also explained the scope of the study which covered only the listed Nigeria food products on the Nigerian Stock Exchange. The study also covered a period of ten years from 2004-2013.

Chapter two contained the review of related literature on concepts, findings and theories related to the subject matter of the study. The studies reviewed revealed that result of the impact of liquidity management on profitability have remained mixed, both positive and negative.

Chapter three is the research methodology which explained the relevant research tools that were adopted for the study. It shows that ex-post facto research design was used in view of the nature and purpose of the study. Similarly, the chapter explained the population of the study and the sample size. Data was collected from the annual report and accounts of the sampled foods and for a period of 10 years, from 2004-2013.

The study used panel data from secondary sources only, because the core data needed for the analysis can be adequately and conveniently extracted from the audited financial reports of the listed Nigerian food products companies within the period of the study. Multiple regressions analysis was adopted to examine the model of the study. In addition, the data generated were analyzed using descriptive statistics and correlation using Stata (version 12.0).

Chapter four presented, analyzed and interpreted the data generated for the study. The results of which was used to test the hypotheses of the study. The result of the analyses (Multiple regression, t-test, Pearson correlation coefficient and descriptive statistics) led to the rejection of null hypothesis. Also, the results of robustness tests (multicollinearity, heteroskedasticity and Hausman specification) were conducted in order to assess the validity of all statistical techniques

used for the study. Based on the analysis and interpretation of data, the following are the findings of the study;

1. Cash conversion circle has a positive relationship with ROA in both Random effect and Fixed effect regression results and statistically not significant at 5% level of significance. This implies that cash conversion circle has statistically insignificant positive impact on the profitability (ROA) of the listed Nigerian food products companies. It means that low cash conversion circle may have positive effect on the liquidity which will as well improve the profitability of the companies.
2. Size has a positive and significant relationship with ROA in both fixed effect and random effect results. This implies that profitability improves as food product companies grow bigger in asset size, meaning that food products firms that are bigger in size have higher ROA.
3. Growth and leverage have negative and insignificant relationship with return on asset. This implies that changes in growth and leverage do not have much effect on return on asset.
4. Cash conversion circle has a positive relationship with ROE in both Random effect and fixed effect regression results and the relationship is statistically significant at 5% level of significance. This implies that cash conversion circle has statistically significant positive impact on the profitability (ROE) of the listed Nigerian food products companies. It means that low cash conversion circle may have positive effect on the liquidity which will as well improve the profitability of the companies.
5. The relationship between size and ROE is positive and statistically significant in both fixed effect and random effect results. While growth and leverage have negative

relationship with ROE and the relationship is not statistically significant. This means that when leverage of the firm increases; it will adversely affect its profitability in terms of financial cost.

### **5.3. Conclusion**

This study examines the effects of liquidity management on profitability of listed Nigerian food product companies; based on the findings above the study concludes that:

1. Cash conversion circle has a positive relationship with ROA and the relationship is not statistically significant. This implies that cash conversion circle has statistically insignificant positive impact on the profitability (ROA) of the listed Nigerian food product company. It means that low cash conversion circle may have positive effect on the liquidity which will as well improve the profitability of the companies.
2. Cash conversion circle has a positive relationship with ROE and the relationship is statistically significant. This implies that cash conversion circle has statistically significant positive impact on the profitability (ROE) of the listed Nigerian food products companies. It means that low cash conversion circle may have positive effect on the liquidity which will as well improve the profitability of the companies.
3. Size has a positive relationship with ROA and ROE, the relationship is statistically significant. This suggests that larger firms can improve profitability because of their reduced operating cost and cost of innovations.

4. Growth and leverage have negative relationship with ROA and ROE, the relationship is not statistically significant. This means that when leverage of the firm increases; it will adversely affect its profitability in terms of financial cost.

### **5.3. Recommendations**

The following are the recommendations that are made based on the conclusions of the study;

1. 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. Although there is an inverse relationship between liquidity and profitability, but day to day management of firm's short term assets and liabilities plays an important role in the success of the firm. Therefore, liquidity should be managed in order to obtain an optimal level, that is, a level that provides reasonable level of profitability
2. Cash conversion cycle measures the time lag it takes company's investment in raw material to be realized. Management should strive to maintain a very low CCC. A longer CCC may have negative effect on the liquidity of the companies which as well affect profitability because cash will be tied in raw material, inventory or account receivable. Managers can create value for their shareholders by reducing the number of days of accounts receivable and inventories to a reasonable minimum.
3. Furthermore, companies are capable of gaining sustainable competitive advantage by means of effective and efficient utilization of the resources of the organization through a careful reduction of the cash conversion cycle to its minimum. In doing

so, the profitability of the firm is expected to increase. Therefore, managers can create profits for their companies by handling correctly the cash conversion cycle and keeping each different component (accounts receivables, accounts payables and inventory) to an optimum level.

4. Managers should take note of the negative effect of leverage on profitability as increase in debt will reduce profitability. Managers should try to reduce the debt by managing the internally generated revenue to finance the business since existence of debt increases the agency cost for the firms (Weill 2003) and this will cause a corresponding negative effect on profitability.
5. Food product firms should be encouraged to increase their asset base since increased in asset size has possibility of improving the firm`s profitability.

## References:

- Afza, T. and Nazir, M.S. (2009). Impact of aggressive working capital management policy on firm's profitability *Journal of Quality and Technology Management*, 3(2), 11-21
- Agbada A, and C.C. Osuji (2013) "The efficiency of liquidity management and banking performance in Nigeria. *International Journal of Research Review of Management and Business*, 2(3), 19-30
- Ahmed, I. (2010). Impact of Working Capital Management on Performance of Listed Non Financial Companies of Pakistan. *International Journal of Research Review of Management and Business*, 2, 19-30.
- Ajanthan, A. (2013). A Nexus between Liquidity and Profitability: A study of trading companies in Sri lanka. *European Journal of Business and Management*. 3, 56-69
- Akinsuleri, O. (2011) *Financial Management (seventh edition)*, Lagos: El-Toda ventures Ltd. 43, 672-673,
- Al Nimer M., Warrad L, and Al Omari (2013).The Impact of Liquidity on Jordanian Banks Profitability through Return on Asset. *Interdisciplinary Journal of Research in Business* 5(4), 145-167.
- Ali, S. Q. (2012) Capital Management and Firms Performance: Evidence from Pakistan. *International Journal of Research in Business and Economics* 2, 10
- Alshatti, A.S. (2014). The Effect of the Liquidity Management on Profitability in the Jordanian Commercial Banks. Vietnam Case. *International Research Journal of Finance and Economics*, 49, 59-67.
- Amarjit, G., Nahum, B. & Neil, M. (2010). The relationship between working capital management and profitability: *Evidence from The United States. Academic journal of Business and Economics*, 2010, 10
- Anojan, V. (2014) Liquidity Management, Capital Structure and Their Impact on Profitability. *International Journal of Business and Management* , 7, 130-138
- Ashwin Madhou, A. (2013) Does Working Capital affect Corporate Profitability? Evidence from the Australia. *Business and Economics Journal*, 201, 10
- Asika, N. (1991) *Research Methodology in Behavioral Sciences*. Longman Nigeria Plc

- Azhar, N., & Noriza, M. (2010). Working Capital Management: The Effect of Market Valuation and Profitability in Malaysia. *International Journal of Business and Management*, 5 (11), 140-147.
- Bagchi, B. and Khamruiz, B. (2012) Relationship between working capital management and profitability: A study of selected FMCG companies. *Journal of India Business and Economics*, 2012: 60
- Banerjee, S., Gatchev, V.A., and Spindt, P.A.,( 2007). Stock Market Liquidity and Firm Dividend Policy. *Journal of Financial and Quantitative Analysis*, 42(2), 369-398.
- Bhattacharya, H., (2008). Theories of Trade Credit: Limitations and Applications Available from: <http://ssrn.com/abstract=1286443> [Accessed 25 November 2010].
- Bhunia, A. (2010). A trend analysis of liquidity management efficiency in selected private sector Indian steel industry. *International Journal of Research in Commerce and Management*, 5, 213.
- Bodie, Z. & Merton, R. C. (2000). *Finance*, International Edition, Prentice-Hall, New Jersey.
- Bordereau, E. & Graham, C. (2010). *The impact of liquidity on banks profitability*. Bank of Canada Working Paper 2010, ISSN 1701-9397
- Business Dictionary.com (2010) *Business Management Dynamics* 22, Aug 2012, 10-25
- Chakraborty, K. (2008). Working capital and profitability: An empirical analysis of their relationship with reference to selected companies in the Indian pharmaceutical industry, *The ICAI Journal of Management Research*, 34, 5-7
- Chatterjee, S. (2010). The impact of working capital management on the profitability of the listed companies on the London stock exchange". Working Paper Series, SSRN
- Deloof M. (2003). Does working capital management affects profitability of Belgian firms? *Journal of Business Finance & Accounting*, 30 (3), 573-87.
- Dong, H. P. & Su, J. (2010). The Relationship between Working Capital Management and Profitability: A Vietnam Case. *International Research Journal of Finance and Economics*, 49, 59-67
- Egbide, B., Uwigbe, O. and Uwalomwa, U. (2013) Liquidity management and profitability of manufacturing companies in Nigeria *OSR Journal of Business and Management (IOSR-JBM)* e-ISSN: 2278-487X. 9, (1),13-21.
- Eljelly, A. (2004). Liquidity-Profitability Tradeoff: An empirical Investigation in An Emerging Market, *International Journal of Commerce & Management*, 14(2). 48 – 61.

- Emery G.W., (1987). An Optimal Financial Response to Variable Demand. *Journal of Financial and Quantitative Analysis*, 22, 209-225.
- Falope, O.I. & Ajilore, O.T. (2009). Working Capital Management and Corporate Profitability. Evidence from Panel Data Analysis of Selected Quoted Companies in Nigeria, *International Journal of Business Management* 3,73-84.
- Fathi S, Hashemi S. and Firuzkuhi, Z. (2011). “The effect of earnings management on stock liquidity of listed companies in Tehran Stock Exchange. *Interdisciplinary Journal Research in Business. Financial Studies*, 10(3), 661-691.
- Frank, Murray Z., & Goyal, Vidhan K. (2003). Testing the pecking order theory of capital structure. *Journal of Financial Economics*, 67(2003), 217-248
- Freixas, X., (1993), Short-Term Credit versus Accounts Receivable Financing. Universidad Pompeu Fabra, Economics Working Paper, 27.
- Ganesan, V., (2007). An analysis of working capital management efficiency in telecommunication equipment industry. *River Academic Journal*, 3(2), 1-10.
- Garcia-Teruel, P.J. and Martinez-Solano, P. (2007). Effects of working capital management on SME profitability, *International Journal of Managerial Finance*, 3, Issue 2.
- Gill, A., Biger, N., and Mathur, N., (2010). The relationship between working capital management and profitability: evidence from the United States. *Business and Economics Journal*, 10, 1-9.
- Godfred, A.A. (2013). Working capital management and profitability of UK small and medium enterprises, *Centre for Finance and Risk*. The Business School, Bournemouth University
- Gumaraes. A. and Nossa, V. (2010). Working capital profitability, liquidity and solvency of health care insurance companies. *Brazilian Business Review (BBR) Victoria ES*, 37-58.
- Haresh B. (2012). Working capital management and profitability: Evidence from India – An empirical study, *GFJMR*, 1-66.
- Hutchison, P. D., Farris II, M. T. and Anders, S. B.( 2007). “Cash-to-cash analysis and management”, *The CPA Journal*, 77(8), 42-47.
- Ibi, S.O. (2013) The Impact of Liquidity Management on the Profitability of Banks in Nigeria. *Journal of Finance and Bank Management* 1(1); June 2013 37-48.
- Ifurueze, M.S.K. (2013). The Impact of Effective Management of Credit Sales on Profitability and Liquidity of Food and Beverage Industries in Nigeria. *Global Journal of Management and Business Research* 13(2) 1.0 .

- Jain, N., (2001). Monitoring Costs and Trade Credit. *Quarterly Review of Economics and Finance*, 41(1), 89-110.
- James, C. & Van, H. (2002). *Financial Management and Policy*, Prentice hall of India Private Limited, New Delhi, 343.
- Jensen, M. C. (1986). Agency Cost of Free cash flow, Corporate Finance and Takeovers. *The American Economic review*, 76, (2) 323-329.
- Jose, M. L., Lancaster, C. & Stevens, J. L. (1996). “Corporate returns and cash conversion cycles”, *Journal of Economics and Finance*, 20 (1) 33-46.
- Jose, M.L. & Lankaster, C. (1996) Corporate returns and cash conversion cycle. *Journal of Economic and Finance*, 20 (1) 33-46.
- Kamath, R., Khaksari, S. & Hylton, H. (1985). Management of excess cash: practices and developments, *Financial Management*, 14, (3), 70-77.
- Kandori, M., (1992). Social Norms and Community Enforcement. *Review of Economic Studies*, 59(1), 63-80.
- Karaduman, H.A., Akbas, H.E., Ozsozgun, A. and Durer S (2010). Effects of Working Capital Management on Profitability. The Case of Selected Companies in the Istanbul Stock Exchange (2005-2008)”, *International Journal of Economic and Finance, Stud.* 2(2):47-54.
- Khamrui, B. and Bagchi, B. (2012). Relationship between Working Capital Management and Profitability: A Study of Selected FMCG Companies in India.
- Kurawa & Abubakar. (2014). An Evaluation of the impact of liquidity on the profitability of Nigerian banks. *Research Journal of Management* 2, (7) August | 2014 ISSN 2347-8217
- Lamberg, S. & Valming, S. ( 2009). “Impact of liquidity management on profitability. A study of the adoption of liquidity in a financial crises.. Master Thesis, Umea School of Business, Umea University.
- Langroudi , M.M., Biabani, S. and Somesaraei, M.K. (2013). Evaluation the impact of working capital management on firms performance (case study: firms accepted in Tehran stock exchange) *International Research Journal of Applied and Basic Sciences* © 2013 Available online at [www.irjabs.com](http://www.irjabs.com) ISSN 2251-838X / ,6 (12): 1817-1828 Science Explorer Publications.
- Langroudi, M.M., Biabani, S. and Somesaraei, M.K. (2013). Evaluation the impact of working capital management on firms performance (case study: firms accepted in Tehran stock exchange) *International Research Journal of Applied and Basic Sciences*, 6(12), 1817-1828

- Lartey V., Antwi S. & Boadi E. (2013), The Relationship between Liquidity and Profitability of Listed Banks in Ghana. *International Journal of Business and Social Science*, 4(3), 112-115
- Lartey, A.B. (2013). The Relationship between Liquidity and Profitability of Listed Banks. *Ghana International Journal of Business and Social Science*, 4(3) 34-36
- Lazaridis, I., & Tryfonidis, D. (2006). Relationship between Working Capital Management and Profitability of Listed Companies in the Athens Stock Exchange. *Journal of Financial Management and Analysis*, 19 (1), 26-35.
- Mansoori, E. and Muhammed, J. (2012). The Effect of Working Capital Management on Firm's Profitability: Evidence from Singapore
- Mathuva, D., (2010). The influence of working capital management components on corporate profitability: A survey on Kenyan listed firms. *Research Journal of Business Management*, 4 (1), 1-11.
- Misbah,S., Khan, S.U., Ul-abrar, S., Jamil, M. & Khalifa, Z.B. (2013). Testing the Impact of Working Capital Management on Return on Equity -A Case of Pakistani Firms *Economics and Finance Review*, 2, 55 – 67.
- Modigliani, F., (1957). Business Reasons for Holding Inventories and Their Macro-Economic Implications, NBER Chapters. In: Problems of Capital Formation: Concepts, Measurement, and Controlling Factors. *National Bureau of Economic Research*, Inc, 495-511.
- Mojtahedzadeh, V., Tabari, S. and Mosayebi, P. (2011). The relationship between working capital management and profitability of the companies (Case study: Listed Companies on TSE). *International Research Journal of Finance and Economics*, 76, 158-166.
- Moss, J. D., and Stine, B.,(1993). Cash conversion cycle and firm size: a study of retail firms. *Managerial Finance*, 19 (8), 25-34.
- Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information those investors do not have. *Journal of Financial Economics*, 13, 187-221.
- Naser A. Tabari, A. and Ma'someh, E. (2013). The Effect of liquidity risk on the performance of commercial banks. *International Research Journal of Applied and Basic Sciences* 4 (6): 1624-1631
- Nelson, R. R., (2002). Technology, institutions, and innovation systems. *Research Policy*, 31(2), 265-272.
- Niresh, J. (2012). "Trade –off between liquidity and profitability", *International Conference Research Journal*, 1-III).

- Nwaezeke, N.C. (2006). *Theories and practice of Financial Management*. Owerri. Ever Standard Publishers.
- Oladipupo, A.O. and Okafor, C.A. (2013). Relative contribution of working capital management to corporate profitability and dividend payout ratio Evidence from Nigeria. *OSR Journal of Business and Management (IOSR-JBM)* e-ISSN: 2278-487X. 9(1) , 13-21.
- Owolabi, S.A. and Alu, C.N. (2012) Effective working capital Management and profitability: A Study of Selected Quoted Manufacturing Companies. *Nigeria Economics and Finance Review* 2, 55 – 67. Available online at <http://www.businessjournalz.org/efr>
- Owolabi, S.A. and Obida, S.S. (2012) Liquidity Management and Corporate Profitability of Selected Manufacturing Companies Listed on the Nigerian Stock Exchange. *Journal of Business Management Dynamics* 2, 10-25
- Padachi, K., (2006). Trends in working capital management and its impact on firms' performance: an analysis of Mauritian small manufacturing firms, *International Review of Business Research Papers*, 2(2), 45 -58.
- Pandy, I.M. (2005). *Financial management*, 9<sup>th</sup> edition, New Delhi, India, Vikas Publishing House Ltd. Performance: An Empirical Study." *Global Business Review* 8, 267.
- Petersen, M. A., and Rajan, R. G. (1997).Trade Credit: Theories and Evidence. *The Review of Business Research Papers*, 2, 49 -68.
- Raheman, A. & Nasr, M. (2007). Working capital management and profitability: case of Pakistani firms, *International Review of Business Research Papers*, 3, (1), 279- 300.
- Raheman, A., Afzan, T. and Bodla, M. A. (2010) Working Capital Management and Corporate Performance of Manufacturing Sector in Pakistan. *International Research Journal of Finance and Economics*, 47, 156-169.
- Rajdev, M.S. (2013). Trade-off between liquidity and profitability, An empirical study. *Journal of Arts, Science & Commerce* 4(3).
- Reahn, K. (2012). Effects of working capital management on corporate profitability An Industry-wise study of finish and Swedish public companies. Vietnam Case. *International Research Journal of Finance and Economics*, 49, 59-67
- Saghir, A., Hashmi, F. M. and Hussain, M. N. (2011). Working capital management and profitability: Evidence from Pakistan. *Interdisciplinary Journal of Contemporary Research in Business*, 3,1092-1105
- Saleem, Q. and Rehman, R. (2011). Impacts of Liquidity Ratios on Profitability; *Interdisciplinary Journal of Research in Business* 1, 95-98

- Samiloglo, F., & Demirgünes, K. (2008). The Effect of Working Capital Management on Firm Profitability: Evidence from Turkey. *The International Journal of Applied Economics and Finance*, 2 (1), 44-50.
- Schwartz, A., (1974). An economic model of trade credit. *Journal of Financial and Quantitative Analysis*, 9, 643-657.
- Sebastian, G. (2010). A Theory of Corporate Financial Decisions with Liquidity and Solvency Concerns. *Journal of Financial Economics*, 99, 365-384.
- Siddiqi, M. N. (1971). *Recent Theories of Profit*. Aligarh: Aligarh Muslim University Press.
- Soku, B. (2011). Financial Flexibility and Capital Structure Decision. April 2, 2012. <http://ssrn.com/abstract=1108850>
- Stowe J, and Gehr A.( 1985). Contract costing and trade credit. *Paper presented at The Western Finance Association Meeting*, June.
- Taani, K. (2012). Impact of Working Capital Management Policy and Financial Leverage on Financial Performance: Empirical evidence from Amman Stock Exchange – listed companies *International Journal of Management Sciences and Business Research*, 1, 8. (ISSN: 2226 -8235)
- Toby, A.J. (2014). Working capital management policy and corporate profitability of Nigerian quoted companies: a sectoral analysis. *International Journal of Financial Management (IJFM)* 3, 9-20
- Uremadu, S. (2012). Bank capital structure, liquidity and profitability evidence from the Nigerian Banking System. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 2 (2012) ISSN: 2225-8329
- Usama, M. (2012). Working capital management and its affect on firm's profitability and liquidity: In Other food sector of (KSE) Karachi Stock Exchange. *Arabian Journal of Business and Management Review* 1, (12)
- Van Der Wijst, N., and Hol, S., (2002). Trade credit in Europe. Mimeo, Norwegian University of Science and Technology, Trondheim.
- Vieira, R.S. (2010). The relationship between liquidity and profitability. Master Thesis, 15 hp
- Vijayakumar, A. and Nadu, J. (2011) Management of Corporate Liquidity and Profitability: An Empirical study. *International Journal of Marketing and Technology* <http://www.ijmra.us>.
- Vishnani, S. and Bhupesh, K.S. (2007). "Impact of Working Capital Management Policies on Corporate.

Zariyawati, A.M. and Annuar, N.M. (2009). Working Capital Management and Corporate performance of Malaysian firms. *Journal of Modern Accounting and auditing* 5.

Zygmunt, J. (2013). Does Liquidity impact on profitability? Conference of Informatics and Management Sciences.

## APPENDIX A

```
_____ (R)
/___ / ___/ / ___/
___/ / ___/ / ___/ 11.1 Copyright 2009 StataCorp LP
Statistics/Data Analysis StataCorp
4905 Lakeway Drive
Special Edition College Station, Texas 77845 USA
800-STATA-PC http://www.stata.com
979-696-4600 stata@stata.com
979-696-4601 (fax)
```

Single-user Stata license expires 31 Dec 9999:

Serial number: 71606281563

Licensed to: STATAForAll

STATA

Notes:

1. (/m# option or -set memory-) 500.00 MB allocated to data
2. (/v# option or -set maxvar-) 5000 maximum variables

running C:\Users\user\Desktop\Stata11-Portable\profile.do ...

unable to change to D:\Research\CRA\

r(170);

. \*(11 variables, 60 observations pasted into data editor)

. tsset firm year

panel variable: firm (strongly balanced)

time variable: year, 2004 to 2013

delta: 1 unit

. xtreg roa cccl size growth lev1, re

```
Random-effects GLS regression           Number of obs   =           60
Group variable: firm                   Number of groups =            6

R-sq:  within = 0.1427                 Obs per group:  min =           10
        between = 0.6471                avg =           10.0
        overall = 0.2849                max =           10

Random effects u_i ~ Gaussian           Wald chi2(4)    =           10.89
corr(u_i, X) = 0 (assumed)             Prob > chi2     =           0.0278
```

---

roa	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
cccl	.000305	.0002951	1.03	0.301	-.0002733	.0008833
size	.1548343	.052878	2.93	0.003	.0511953	.2584733
growth	-.0023289	.016005	-0.15	0.884	-.0336981	.0290403
lev1	-.0011375	.0043592	-0.26	0.794	-.0096815	.0074064
_cons	-1.412931	.4893009	-2.89	0.004	-2.371943	-.4539189

---

sigma_u	.21958686
sigma_e	.26325622
rho	.41029165 (fraction of variance due to u_i)

---

```
. estimates store random
```

```
. xtreg roa cccl size growth lev1, fe
```

```
Fixed-effects (within) regression      Number of obs   =      60
Group variable: firm                   Number of groups =       6

R-sq:  within = 0.1430                 Obs per group:  min =      10
      between = 0.6475                   avg =           10.0
      overall  = 0.2818                   max =           10

                                           F(4,50)         =      2.09
corr(u_i, Xb) = 0.3568                 Prob > F        =      0.0965
```

```
-----+-----
      roa |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----+-----
      cccl |   .0002969   .000303    0.98  0.332   - .0003118   .0009055
      size |   .1397396   .056418    2.48  0.017   .0264208   .2530585
 growth |  -.0027886   .0165053   -0.17  0.867   -.0359405   .0303633
      lev1 |  -.0016262   .0045092   -0.36  0.720   -.0106831   .0074307
   _cons |  -1.274899   .5139788   -2.48  0.017   -2.307256   -.2425423

-----+-----

sigma_u |   .16894173
sigma_e |   .26325622
      rho |   .29169877   (fraction of variance due to u_i)

-----+-----

F test that all u_i=0:      F(5, 50) =      3.47      Prob > F = 0.0091
```

```
. estimate store fixed
unrecognized command: estimate
r(199);
```

```
. estimates store fixed
```

```
. hausman fixed random
```

```

      ---- Coefficients ----
      |      (b)      (B)      (b-B)      sqrt(diag(V_b-V_B))
      |      fixed      random      Difference      S.E.
-----+-----
      ccc1 |      .0002969      .000305      -8.18e-06      .000069
      size |      .1397396      .1548343      -.0150947      .0196698
      growth |     -.0027886     -.0023289      -.0004597      .0040331
      lev1 |     -.0016262     -.0011375      -.0004887      .0011532
-----+-----

```

```

      b = consistent under Ho and Ha; obtained from xtreg
      B = inconsistent under Ha, efficient under Ho; obtained from xtreg

```

```
Test: Ho: difference in coefficients not systematic
```

$$\begin{aligned}
 \text{chi2}(4) &= (b-B)'[(V_b-V_B)^{-1}](b-B) \\
 &= 0.60 \\
 \text{Prob}>\text{chi2} &= 0.9626
 \end{aligned}$$

```
. xtreg roa ccc1 size growth lev1, fe
```

```

Fixed-effects (within) regression                Number of obs    =        60
Group variable: firm                            Number of groups  =         6

R-sq:  within = 0.1430                          Obs per group: min =        10
        between = 0.6475                          avg =            10.0
        overall = 0.2818                          max =            10

                                                F(4,50)          =        2.09
corr(u_i, Xb) = 0.3568                          Prob > F         =        0.0965

```

```

-----+-----
      roa |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----+-----
      ccc1 |   .0002969   .000303    0.98  0.332   - .0003118   .0009055
      size |   .1397396   .056418    2.48  0.017   .0264208   .2530585
  growth |  -.0027886   .0165053   -0.17  0.867   -.0359405   .0303633
      lev1 |  -.0016262   .0045092   -0.36  0.720   -.0106831   .0074307
     _cons | -1.274899   .5139788   -2.48  0.017   -2.307256  -.2425423
-----+-----

sigma_u |   .16894173
sigma_e |   .26325622
      rho |   .29169877   (fraction of variance due to u_i)
-----+-----

```

```

F test that all u_i=0:      F(5, 50) =      3.47          Prob > F = 0.0091

```

```

. xtreg roa ccc1 size growth lev1, re

```

```

Random-effects GLS regression                Number of obs    =        60

```

Group variable: firm                                  Number of groups =                  6

R-sq:    within = 0.1427                                  Obs per group: min =                  10  
           between = 0.6471                                                                   avg =                  10.0  
           overall = 0.2849                                                                   max =                  10

Random effects u\_i ~ Gaussian                                  Wald chi2(4) =                  10.89  
 corr(u\_i, X) = 0 (assumed)                                  Prob > chi2 =                  0.0278

```
-----+-----
```

roa	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
cccl	.000305	.0002951	1.03	0.301	-.0002733	.0008833
size	.1548343	.052878	2.93	0.003	.0511953	.2584733
growth	-.0023289	.016005	-0.15	0.884	-.0336981	.0290403
lev1	-.0011375	.0043592	-0.26	0.794	-.0096815	.0074064
_cons	-1.412931	.4893009	-2.89	0.004	-2.371943	-.4539189

```
-----+-----
```

sigma_u	.21958686					
sigma_e	.26325622					
rho	.41029165	(fraction of variance due to u_i)				

```
-----
```

. regress roa cccl size growth lev1

```
-----+-----
```

Source	SS	df	MS	Number of obs =                  60	
Model	1.89222213	4	.473055533	F( 4, 55) =	5.58
				Prob > F =	0.0008

```

Residual | 4.66641485    55 .084843906    R-squared    = 0.2885
-----+-----
Total    | 6.55863698    59 .111163339    Root MSE     = .29128

```

```

-----
      roa |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----+-----
      cccl | .0003286   .0003274      1.00  0.320    - .0003276   .0009848
      size | .2161311   .0485109      4.46  0.000     .1189131   .3133491
  growth | -.0024707   .0173852     -0.14  0.888    - .0373113   .03237
      lev1 | .0008179   .0046709      0.18  0.862    - .0085429   .0101786
      _cons | -1.971696   .4398371     -4.48  0.000    -2.85315   -1.090243
-----

```

```
. estat hettest
```

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of roa

chi2(1) = 23.05

Prob > chi2 = 0.0000

```
. regress roa cccl size growth lev1, rubost
```

option rubost not allowed

```
r(198);
```

```
. regress roa cccl size growth lev1, robust
```

Linear regression

Number of obs = 60

F( 4, 55) = 14.57

Prob > F = 0.0000

R-squared = 0.2885

Root MSE = .29128

```
-----+-----
```

		Robust				[95% Conf. Interval]	
roa	Coef.	Std. Err.	t	P> t			
cccl	.0003286	.0003486	0.94	0.350	-.0003701	.0010273	
size	.2161311	.0631582	3.42	0.001	.0895593	.3427029	
growth	-.0024707	.0048545	-0.51	0.613	-.0121994	.007258	
lev1	.0008179	.0017479	0.47	0.642	-.0026849	.0043207	
_cons	-1.971696	.6041367	-3.26	0.002	-3.182413	-.7609793	

```
-----+-----
```

. estat vif

```
-----+-----
```

Variable	VIF	1/VIF
lev1	1.08	0.921910
cccl	1.06	0.942203
size	1.04	0.957611
growth	1.00	0.996265

```
-----+-----
```

Mean VIF	1.05	
----------	------	--

```
. summarize roa roe cccl icpl cpp size growth lev1
```

Variable	Obs	Mean	Std. Dev.	Min	Max
roa	60	.0041862	.3334117	-1.2729	.7438
roe	60	1.856081	8.170345	-4.1507	62.863
cccl	60	56.70589	119.3105	-592.33	303.4344
icpl	60	99.04015	98.57883	0	481.579
cpp	60	76.42583	133.4067	8.213	902.185
size	60	9.058119	.7988227	6.6118	10.7079
growth	60	.5846117	2.185336	0	17.095
lev1	60	1.166265	8.455449	0	65.55405

```
. correlate roa roe cccl icpl rcp cpp size growth lev1
```

```
(obs=60)
```

```
. summarize roa roe cccl icpl rcp cpp size growth lev1
```

Variable	Obs	Mean	Std. Dev.	Min	Max
roa	60	.0041862	.3334117	-1.2729	.7438
roe	60	1.856081	8.170345	-4.1507	62.863
cccl	60	56.70589	119.3105	-592.33	303.4344
icpl	60	99.04015	98.57883	0	481.579
rcp	60	34.09158	42.84065	0	223.352
cpp	60	76.42583	133.4067	8.213	902.185
size	60	9.058119	.7988227	6.6118	10.7079

```

growth |          60    .5846117    2.185336          0    17.095
lev1   |          60    1.166265    8.455449          0   65.55405

```

```

|          roa          roe          cccl          icpl          rcp          cpp          size          growth lev1
lev1
-----+-----
-----
roa |    1.0000
roe |    0.1420    1.0000
cccl |    0.1611    0.2998    1.0000
icpl |    0.1627    0.2665    0.5850    1.0000
rcp  |    0.1429    0.0338   -0.3919    0.2088    1.0000
cpp  |    0.0220   -0.0604   -0.5879    0.2828    0.8259    1.0000
size |    0.5226    0.3415    0.0762   -0.0489    0.0135   -0.0999    1.0000
growth |    0.0137   -0.0140    0.0203    0.0164   -0.0295   -0.0155    0.0524    1.0000
lev1 |   -0.0391   -0.0357    0.2123    0.2350   -0.0951   -0.0467   -0.1631    0.0210
1.0000

```

```
. xtreg roe cccl size growth lev1, fe
```

```

Fixed-effects (within) regression          Number of obs      =          60
Group variable: firm                       Number of groups   =           6

R-sq:  within = 0.1627                     Obs per group: min =          10
        between = 0.3434                    avg =              10.0
        overall = 0.1867                    max =              10

                                          F(4,50)            =          2.43
corr(u_i, Xb) = -0.0184                    Prob > F            =          0.0597

```

## APPENDIX B

```

-----
      roe |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----+-----
      cccl |   .0172588   .0087033     1.98   0.053   - .0002223   .0347398
      size |   3.370348   1.620431     2.08   0.043    .1156166   6.625079
  growth |  - .3976108   .4740644    -0.84   0.406   -1.349797   .5545755
      lev1 |   .0138529   .129512     0.11   0.915   - .2462796   .2739854
     _cons | -29.43531   14.76245    -1.99   0.052   -59.08656   .215937
-----+-----

  sigma_u | 2.6255122
  sigma_e | 7.561218
      rho | .1075982   (fraction of variance due to u_i)
-----+-----

F test that all u_i=0:      F(5, 50) =      1.09          Prob > F = 0.3780

. xtreg roe cccl size growth lev1, re

Random-effects GLS regression                Number of obs   =      60
Group variable: firm                        Number of groups =      6

R-sq:  within = 0.1542                      Obs per group: min =      10
      between = 0.4673                          avg =      10.0
      overall = 0.1952                          max =      10

Random effects u_i ~ Gaussian                Wald chi2(4)    =      13.34
corr(u_i, X) = 0 (assumed)                  Prob > chi2     =      0.0097
-----

```

roe	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
-----+-----						
cccl	.0195868	.0085342	2.30	0.022	.00286	.0363136
size	3.21436	1.264361	2.54	0.011	.7362581	5.692462
growth	-.1321428	.4531172	-0.29	0.771	-1.020236	.7559506
lev1	-.0428966	.1217405	-0.35	0.725	-.2815036	.1957105
_cons	-28.24338	11.46367	-2.46	0.014	-50.71176	-5.775001
-----+-----						
sigma_u	0					
sigma_e	7.561218					
rho	0	(fraction of variance due to u_i)				
-----+-----						

```
. regress roe size growth lev1, rubost
```

```
option rubost not allowed
```

```
r(198);
```

```
. estat hettest
```

```
invalid subcommand hettest
```

```
r(321);
```

```
. regress roe cccl size growth lev1
```

Source	SS	df	MS	Number of obs =	60
-----+-----				F( 4, 55) =	3.33
Model	768.607018	4	192.151754	Prob > F =	0.0163
Residual	3169.91021	55	57.6347311	R-squared =	0.1952
-----+-----				Adj R-squared =	0.1366
Total	3938.51723	59	66.7545293	Root MSE =	7.5918

```
-----
```

roe	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
-----+-----						
cccl	.0195868	.0085342	2.30	0.026	.0024838	.0366898
size	3.21436	1.264361	2.54	0.014	.6805241	5.748196
growth	-.1321428	.4531172	-0.29	0.772	-1.04021	.7759243
lev1	-.0428966	.1217405	-0.35	0.726	-.2868701	.2010769
_cons	-28.24338	11.46367	-2.46	0.017	-51.21709	-5.269673

```
-----
```

```
. estat hettest
```

```
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
```

```
Ho: Constant variance
```

```
Variables: fitted values of roe
```

```
chi2(1) = 135.34
```

```
Prob > chi2 = 0.0000
```

```
.regress roe size growth lev1, robust
```

```
Linear regression
```

```
Number of obs = 60
```

```
F( 3, 56) = 2.42
```

```
Prob > F = 0.0753
```

```
R-squared = 0.1181
```

```
Root MSE = 7.8757
```

```
-----
```

	Robust					
roe	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
size	3.545938	2.623416	1.35	0.182	-1.709396	8.801272
growth	-.1219723	.1312145	-0.93	0.357	-.3848266	.140882
lev1	.0208397	.0257878	0.81	0.422	-.0308194	.0724989
_cons	-30.21645	22.87353	-1.32	0.192	-76.03764	15.60474

```
-----
```

```
. regress roe cccl size growth lev1, robust
```

Linear regression

```
Number of obs =      60
F( 4, 55) =      1.66
Prob > F      = 0.1720
R-squared     = 0.1952
Root MSE     = 7.5918
```

```
-----
```

	Robust					
roe	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
cccl	.0195868	.018283	1.07	0.289	-.0170531	.0562267
size	3.21436	2.204221	1.46	0.150	-1.202998	7.631718
growth	-.1321428	.1091606	-1.21	0.231	-.3509056	.08662
lev1	-.0428966	.041015	-1.05	0.300	-.1250924	.0392993
_cons	-28.24338	19.93338	-1.42	0.162	-68.19076	11.704

```
-----
```

```
. xtreg roe cccl size growth lev1, fe
```

```
Fixed-effects (within) regression      Number of obs      =      60
Group variable: firm                   Number of groups   =      6

R-sq:  within = 0.1627                 Obs per group: min =      10
      between = 0.3434                   avg =              10.0
      overall = 0.1867                   max =              10

                                           F(4,50)            =      2.43
corr(u_i, Xb) = -0.0184                 Prob > F            =      0.0597
```

```
-----+-----
      roe |      Coef.   Std. Err.      t    P>|t|    [95% Conf. Interval]
-----+-----
      cccl |   .0172588   .0087033     1.98   0.053   - .0002223   .0347398
      size |   3.370348   1.620431     2.08   0.043   .1156166   6.625079
  growth |  -0.3976108   .4740644    -0.84   0.406  -1.349797   .5545755
      lev1 |   .0138529   .129512     0.11   0.915  - .2462796   .2739854
      _cons | -29.43531   14.76245    -1.99   0.052  -59.08656   .215937
-----+-----

      sigma_u |  2.6255122
      sigma_e |  7.561218
      rho     |   .1075982   (fraction of variance due to u_i)
-----+-----
```

```
F test that all u_i=0:      F(5, 50) =      1.09      Prob > F = 0.3780
```

```
. estimates store _fixed
```

```
. xtreg roe cccl size growth lev1, re
```

```
Random-effects GLS regression           Number of obs   =       60
Group variable: firm                    Number of groups =        6

R-sq:  within = 0.1542                  Obs per group: min =       10
        between = 0.4673                  avg =           10.0
        overall = 0.1952                  max =           10

Random effects u_i ~ Gaussian           Wald chi2(4)     =       13.34
corr(u_i, X) = 0 (assumed)              Prob > chi2      =       0.0097
```

```
-----+-----
```

roe	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
cccl	.0195868	.0085342	2.30	0.022	.00286	.0363136
size	3.21436	1.264361	2.54	0.011	.7362581	5.692462
growth	-.1321428	.4531172	-0.29	0.771	-1.020236	.7559506
lev1	-.0428966	.1217405	-0.35	0.725	-.2815036	.1957105
_cons	-28.24338	11.46367	-2.46	0.014	-50.71176	-5.775001

```
-----+-----
```

sigma_u	0					
sigma_e	7.561218					
rho	0	(fraction of variance due to u_i)				

```
-----+-----
```

```
. estimates store _random
```

```
. xtreg roe ccc1 size growth lev1, re
```

```
Random-effects GLS regression           Number of obs   =           60
Group variable: firm                    Number of groups =            6

R-sq:  within = 0.1542                   Obs per group: min =           10
        between = 0.4673                   avg =           10.0
        overall = 0.1952                   max =           10

Random effects u_i ~ Gaussian           Wald chi2(4)     =           13.34
corr(u_i, X) = 0 (assumed)              Prob > chi2      =           0.0097
```

```
-----+-----
      roe |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-----+-----
      ccc1 |   .0195868   .0085342     2.30   0.022     .00286   .0363136
      size |   3.21436   1.264361     2.54   0.011     .7362581  5.692462
  growth |  -.1321428   .4531172    -0.29   0.771    -1.020236 .7559506
      lev1 |  -.0428966   .1217405    -0.35   0.725    -.2815036 .1957105
     _cons | -28.24338   11.46367    -2.46   0.014    -50.71176 -5.775001
-----+-----

sigma_u |           0
sigma_e |   7.561218
      rho |           0   (fraction of variance due to u_i)
-----+-----
```

```
. estimates store random
```

```
. xtreg roe cccl size growth lev1, fe
```

```
Fixed-effects (within) regression      Number of obs      =      60
Group variable: firm                   Number of groups   =      6

R-sq:  within = 0.1627                 Obs per group: min =      10
      between = 0.3434                   avg =              10.0
      overall = 0.1867                   max =              10

                                         F(4,50)            =      2.43
corr(u_i, Xb) = -0.0184                 Prob > F           =      0.0597
```

```
-----+-----
      roe |      Coef.   Std. Err.      t    P>|t|    [95% Conf. Interval]
-----+-----
      cccl |   .0172588   .0087033     1.98   0.053   - .0002223   .0347398
      size |   3.370348   1.620431     2.08   0.043    .1156166   6.625079
  growth |  - .3976108   .4740644    -0.84   0.406   -1.349797   .5545755
      lev1 |   .0138529   .129512     0.11   0.915   - .2462796   .2739854
      _cons | -29.43531   14.76245    -1.99   0.052   -59.08656   .215937
-----+-----

      sigma_u | 2.6255122
      sigma_e | 7.561218
      rho     | .1075982   (fraction of variance due to u_i)
```

```
-----+-----
F test that all u_i=0:      F(5, 50) =      1.09      Prob > F = 0.3780
```

```
. estimates store fixed
```

```
. hausman fixed random
```

```
----- Coefficients -----
```

	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	fixed	random	Difference	S.E.
cccl	.0172588	.0195868	-.002328	.0017069
size	3.370348	3.21436	.1559877	1.013503
growth	-.3976108	-.1321428	-.2654681	.1393623
lev1	.0138529	-.0428966	.0567495	.0441882

```
b = consistent under Ho and Ha; obtained from xtreg
```

```
B = inconsistent under Ha, efficient under Ho; obtained from xtreg
```

```
Test: Ho: difference in coefficients not systematic
```

```
chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
          =          5.77
Prob>chi2 =          0.2169
(V_b-V_B is not positive definite)
```

firm	Year	ccc1	icp1	rep	cpp	size	growth	lev1	roa	roe	debt	assets
1	2004	98.156	67.362	42.587	11.793	8.0599	0.2023	0.057297	0.0343	3.7651	2286270	39901840
1	2005	-30.68	72.495	33.171	136.346	8.3359	0.1982	0.173202	0.0696	2.51	3636961	20998330
1	2006	36.277	60.928	14.867	39.518	6.6118	0.2283	0.05804	-0.0689	-0.3735	2962191	51036832
1	2007	24.336	76.703	15.452	67.819	9.6118	0.1807	0.113391	0.3079	0.951	8633797	76141884
1	2008	56.4602	69.434	15.3712	28.345	9.8836	0.1723	0.489377	0.1698	0.9801	27712129	56627370
1	2009	58.8489	71.3109	10.839	23.301	9.9114	0.291	0.483737	0.226	1.3907	35105510	72571432
1	2010	63.245	104.196	26.222	67.173	9.8959	0.0293	0.105333	0.2095	1.2443	17166387	1.63E+08
1	2011	84.848	85.703	13.181	14.036	10.002	0.223	0.071989	0.2144	1.6261	11753071	1.63E+08
1	2012	81.474	84.39	11.551	14.467	10.0289	0.0754	0.175951	0.2588	2.088	40971530	2.33E+08
1	2013	32.215	89.015	6.129	62.929	10.0581	0.1446	0.22507	0.2362	2.038	63075142	2.8E+08
2	2004	123.4265	81.999	55.755	14.3275	9.20434	0.1205	0.125669	0.0865	2.4871	201180	1600867
2	2005	37.4693	64.374	16.818	43.7227	9.2849	0.3006	0.117661	0.07617	1.9771	226760	1927235
2	2006	303.4344	297.134	50.0884	43.788	10.7079	0.937	0	0.0915	62.863	0	1600086
2	2007	46.245	69.233	12.5235	35.5115	9.2957	17.095	0	-0.0528	-1.4061	0	1567444
2	2008	52.9549	47.334	41.75	36.1291	9.3726	0.1302	0	0.0244	0.7756	0	2358347
2	2009	276.2355	297.134	14.398	35.2965	9.4409	0.3554	0	0.0856	3.1822	0	2759655
2	2010	35.6955	69.233	17.1565	50.694	9.4095	0.1651	0	0.1598	5.5246	0	2567244
2	2011	42.8267	47.334	3.7057	8.213	9.6164	0.1073	0	0.1102	5.1133	0	4134072
2	2012	35.9045	56.803	14.398	35.2965	9.5275	0.0967	0.133494	0.0065	-0.2444	449758	3369113
2	2013	19.6215	53.159	17.1565	50.694	9.559	0.8313	0	0.0621	2.5269	0	3623417
3	2004	249.1827	276	3.7057	30.523	8.0599	0.9523	0	-0.1006	-0.2888	0	114793
3	2005	249.1827	276	3.7057	30.523	8.0599	0.9523	65.55405	-0.1006	-0.2888	14209365	216758
3	2006	102.9435	144.371	14.3275	55.755	8.3359	0.533	1.279896	-0.0689	-0.3735	5236118	4091051
3	2007	72.0837	45.179	43.7227	16.818	9.6118	0.997	0.000685	0.3079	0.951	5236	7648105
3	2008	55.1694	48.869	50.0884	43.788	9.8836	0.2074	0.0036	0.1698	0.9801	29358	8155007
3	2009	82.23	59.242	35.5115	12.5235	9.9114	0.1003	0.005986	0.226	1.3907	47098	7867840
3	2010	60.6979	55.077	41.75	36.1291	9.8959	0.0142	0.003839	0.2095	1.2443	38570	10046709
3	2011	51.3137	54.744	31.8662	35.2965	10.002	0.0814	0.003608	0.2144	1.6261	38570	10689544
3	2012	13.996	39.921	24.769	50.694	10.0289	0.2782	0.003374	0.2588	2.088	38570	11431167
3	2013	46.8995	47.669	27.4655	28.235	10.0581	0.2378	0.120564	0.2362	2.038	38570	319913
4	2004	124.198	95.181	79.363	50.346	8.505	0.423	0	0.056	0.8966	0	335967
4	2005	136.8212	184.819	31.082	79.0798	8.526	0.356	0	0.05117	0.8595	0	332407
4	2006	22.268	39.921	140.481	158.134	8.522	0.3199	0	0.0252	0.4184	0	350253
4	2007	18.542	47.669	36.065	65.192	8.5444	0.364	0	0.01772	0.3103	0	400247
4	2008	73.255	95.181	47.588	69.514	8.6023	0.3999	0	0.0769	1.53885	0	410472
4	2009	137.636	184.819	16.566	63.749	8.6133	0.1605	0	0.05199	1.0671	0	345433
4	2010	282.817	330	16.566	63.749	8.5384	0.253	0	-0.0356	0.6154	0	353117
4	2011	109.5826	330	92.0316	312.449	8.5479	0.0708	0	0.00913	0.16125	0	312517
4	2012	155.171	481.579	157.022	483.43	8.4949	0.728	0	-0.0542	-0.8469	0	320747
4	2013	-592.33	86.503	223.352	902.185	8.5062	0.3987	0	-0.0186	-0.2981	0	883171
5	2004	49.7843	19.205	63.771	33.1917	8.946	0.4598	0.020874	-0.0839	-0.148	17091	818765

5	2005	25.3988	43.0518	140.481	158.134	8.9132	0.599	0.240991	0.10095	0.1651	224004	929511
5	2006	30.247	59.374	36.065	65.192	8.9683	0.3562	0.234	0.0565	0.1049	558868	2388325
5	2007	32.311	54.237	47.588	69.514	9.3781	0.3505	0	0.01573	0.07504	0	2078709
5	2008	7.054	54.237	16.566	63.749	9.31779	0.3198	0	0.02711	0.0923	0	3365077
5	2009	-11.905	35.278	16.566	63.749	9.5269	0.1632	0	0.0222	0.1224	0	2661632
5	2010	180.8829	215	19.659	53.7761	9.4251	0.9216	0	0.7438	3.2419	0	2879366
5	2011	-6.0081	28.109	19.659	53.7761	9.4593	0.1723	0.156625	0.1073	0.50576	416301	2657942
5	2012	-106.837	21.856	32.319	161.012	9.4245	0.7109	0.013229	-0.2287	0.9953	354558	26802086
5	2013	-5.188	139.721	102.672	247.581	10.4282	0.7339	0	0.0611	0.26804	0	661923
6	2004	201.438	215	0	13.562	8.8208	0.3256	0	0.5665	3.2275	0	545593
6	2005	17.1301	28.109	0	10.9789	8.7369	0.252	0	-0.0884	-4.1507	0	488024
6	2006	4.658	21.856	0	17.198	8.6884	0	0	-0.2913	-1.2239	0	328934
6	2007	126.159	139.721	0	13.562	8.5171	0	0	-0.5729	-1.2239	0	161496
6	2008	68.6571	79.636	0	10.9789	8.2082	0	0	-1.2579	-1.7487	0	124664
6	2009	-17.198	0	0	17.198	8.0957	0	0.00201	-0.7886	-0.8463	140	69645
6	2010	-22.1919	0	0	22.1919	7.8428	0	0.002379	-1.2729	-0.7631	164	68934
6	2011	-33.0515	0	0	33.0515	7.8384	0	0	-0.6124	-0.3634	0	88938
6	2012	-30.849	0	0	30.849	7.949	0	0	-0.2295	-0.1757	0	86427
6	2013	-38.792	0	0	38.792	7.9366	0	0	0.1367	0.1017	0	86427