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**THE EFFECT OF WORKING CAPITAL MANAGEMENT
POLICIES ON FIRMS' PROFITABILITY**

(Evidence, from Manufacturing P.L.Cs in Addis Ababa)

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This is to certify that the thesis prepared by Nuru Mohammed, entitled: The effect of working capital management policies on firms' profitability (evidence, from manufacturing p.l.cs in Addis Ababa) and submitted in partial fulfillment of the requirements for the Degree of Masters of Arts (business administration in finance) complies with the regulations of the university and meets the accepted standards with respect to originality and quality.

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ABSTRACT

The management of working capital is very important to businesses of all sizes (Padachi, 2006). Thus, this study examined the effect of working capital management policies (investment and financing policies) on firms' profitability. To investigate this issue, the researcher used audited financial statements of a sample of 22 manufacturing private limited companies in Addis Ababa, for the study period of 2006 to 2010. In this study profitability measures (i.e. return on assets, return on equity and operating profit margin) were considered as dependent variables. The study also considers Accounts receivable period, inventory holding period and accounts payable period as working capital investment policy (independent variables). Cash conversion cycle and current assets to total assets ratio are used as measures of working capital investment policy. As measure of working capital financing policy, current liabilities to total assets ratio is used. In addition, the two traditional measures of liquidity, current ratio and quick ratio, are used as liquidity indicators. Furthermore, the study considers firm size, firm growth rate, financial leverage and annual GDP growth rate of the country as control variables. EViews 6 was used to undertake both correlation and regression analysis of cross-sectional and time series data. The results from the study show that, longer accounts receivable period and inventory holding periods are associated with lower profitability. A weak and negative relationship also exhibited between accounts payable period and profitability measures. A significant negative relationship between cash conversion cycle and profitability measures also recognized. Current assets to total assets ratio and profitability measures are not significantly related. But, findings show a significant positive relationship between current liabilities to total assets ratio and profitability. At last, the negative relationships of liquidity and profitability measures have been observed. Managers, therefore, can increase firms' profitability by improving the efficiency of management of working capital investment and financing policies while, also keeping in view the trade-off between liquidity and profitability.

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Acronyms

APP	Accounts Payable Period
ARP	Accounts Receivable Period
CATAR	Current Assets to Total Assets Ratio
CCC	Cash Conversion Cycle
CLRM	Classical Linear Regression Model
CLTAR	Current Liabilities to Total Assets Ratio
CR	Current Ratio
GDP	Gross Domestic Product
ERCA	Ethiopian Revenue and Customs Authority
FGR	Firm Growth Rate
FL	Financial Leverage
FS	Firm Size
IHP	Inventory Holding Period
OLS	Ordinary Least Squares
OPM	Operating Profit Margin
PLC	Private Limited Company
QR	Quick Ratio
ROA	Return on Assets
ROE	Return on Equity

Chapter One

Introduction

1.1 Background of the Study

Financial manager must be concerned with three basic types of questions. The first question concerns the firm's long-term investments; the process of planning and managing a firm's long-term investments is called capital budgeting. The second question is about ways in which the firm obtains and manages the long-term financing it needs to support its long term investments (or financial structure). The third question concerns working capital management. The term working capital refers to a firm's short-term assets, such as inventory, and its short-term liabilities, such as money owed to suppliers (Ross et al; 2002). Managing the firm's working capital is a day-to-day activity that ensures the firm has sufficient resources to continue its operations and avoid costly interruptions. This involves a number of activities related to the firm's receipt and disbursement of cash.

The two main objectives of working capital management are to increase the profitability of a company and to ensure that it has sufficient liquidity to meet short-term obligations as they fall due and so continue in business. Profitability is related to the goal of shareholder wealth maximization, so investment in current assets should be made only if an acceptable return is obtained. While liquidity is needed for a company to continue in business, a company may choose to hold more cash than is needed for operational or transaction needs, for example for precautionary or speculative reasons. The twin goals of profitability and liquidity will often conflict since liquid assets give the lowest returns. Cash kept in a safe will not generate a return, for example, while a six-month bank deposit will earn interest in exchange for loss of access for the period. (Watson and Head; 2007)

Though there is no standard fixed requirement, all businesses, one way or another, require working capital. The actual amount required will depend on many factors such as the age of the company, the type of business activity, credit policy, market and demand conditions, technology and manufacturing policy, operating efficiency, availability of credit from suppliers and price level changes (Pandey, 2007). It is indispensable that an appropriate amount of working capital is budgeted to meet anticipated future needs. Failure to budget correctly could result in the business being unable to meet its liabilities as they fall due. If a business finds itself in such a situation, it is said to be technically insolvent. In conditions of uncertainty, firms must hold some minimal level of cash and inventories based on expected sales plus additional safety stocks.

The management of working capital is very important to businesses of all sizes (Padachi, 2006). First, it consists of a large portion of firms' investment. It represents around 40 percent of total assets in a typical manufacturing firm and 50 percent to 60 percent of total assets in retailing and wholesales (Moyer, et al., 1995; Sebatleab, 2002). Second, according to Smith (1980), the efficient management of working capital is important from the point of view of liquidity (risk) and profitability as well as firm value. Poor management of working capital results in unnecessary investment in unproductive assets or inadequate investment in current assets. Unnecessary investment in current assets will tie up funds idle and hence reduces firms' ability to invest in productive assets such as plant and machinery, thereby reducing profitability. On the other hand, inadequate investment in current assets reduces the liquidity position causing insolvency, which intern leads to bankruptcy.

According to Sebatleab (2002), working capital management has evolved through control, optimization and value creation stage. Initially, it was started as an organized way of

controlling current assets like balances of cash, receivables and inventories. At this stage the main objective was to make sure that working capital is not embezzled. At that time, both Academicians and practitioners were developed various control procedures. In the optimization phase, the main focus was not only on the physical safety of working capital items but also on the optimization of accounting profits by minimizing related costs and maximizing related income. At this stage particular models like cash optimization models and inventory optimization models were developed to ensure that firms do not get problems due to lack of liquidity or incur too many costs by holding excessive working capital levels. At last stage (value creation), the concern is on how to help managers in the creation of value without disregarding the above two objectives. Particularly, the cash flows approach is used as a main tool to measure the value created by firms. In this study, the researcher uses the cash conversion cycle as a measure of continuous cash or liquidity flow to analyze the effect of working capital policies on firms' profitability.

1.2 Statement of the Problem

The effect of working capital management on corporate profitability has been studied considerably by different researchers (Deloof, 2003; Filbeck and Krueger, 2005; Lazaridis and Tryfonidis, 2006; Padachi, 2006; Samiloglu and Demirgunes, 2008; Shin and Soenen, 1998; Tewodros 2010).

Most of these and other researchers identify significant association between efficiency in working capital management and firms' performance. However, almost all, these studies concentrated on large firms operating within well developed money and capital markets of developed economies. From such findings it is difficult to generalize for relatively small size Ethiopian firms that operate within an undeveloped financial sector (with limited financial markets), where firms mostly obtain funds for investment in working capital from owner

financing, trade credit and short term bank loans. Research studies on the effects of working capital management policies on firms' profitability in developing countries, especially in Ethiopia remained an ignored area of empirical research. To the best of researcher's knowledge, only one research has been done in Ethiopia by Tewodros Abera (2010) on Tigray region.

Generally, to address the issue under consideration, the researcher tried to answer the following research questions.

1. How working capital investment policies affect profitability of manufacturing Private Limited Companies in Addis Ababa?
2. How working capital financing policy affects profitability of manufacturing Private Limited Companies in Addis Ababa?
3. How are profitability and liquidity related, in manufacturing Private Limited Companies of Addis Ababa?

1.3 Objectives of the Study

1.3.1 General Objective

The general objective of this study was to investigate the effect of working capital management policies on profitability of manufacturing private limited companies in Addis Ababa, Ethiopia. At the same time, the study also examined the relationship between the two goals of working capital management policies: liquidity and profitability.

1.3.2. Specific Objectives

Specifically, the aim of this study was:-

1. To study the effect of working capital investment policies on firms' profitability.
2. To look into the effect of working capital financing policy on firms' profitability.
3. To observe the relationship between the two objectives of working capital policies: liquidity and profitability.

1.4 Significance of the Study

The study can be beneficial at least for the following two reasons. First, as it has been discussed in the statement of problem part, no empirical research has been done, yet to examine the effect of working capital management on firms' profitability in Addis Ababa. Therefore, the findings of this study can have a great contribution to the body of knowledge by identifying how working capital management efficiency affect the profitability of manufacturing private limited companies in Addis Ababa. Second, it can serve as a base for other researchers who want to do a further research on this topic.

1.5 Scope of the Study

To address the problem under consideration this research is delimited to:

Topic: the topic of this study is limited to the effects of working capital management policies on firm's profitability whilst, also look into the relationship between profitability and liquidity.

Study area: The geographical scope of this study is limited to the boundary of Addis Ababa, Ethiopia

Variables: the variables used are enclosed to the four types of variables- profitability, working capital policies, liquidity and control variables, which are specific to firms and/or general to the economy as a whole and clearly pinpointed in the methodology part.

Sampling Units and size of sample: the sampling units of this study is delimited to 224 manufacturing private limited companies located and operating in Addis Ababa and the sample size is delimited to 22 companies (i.e. around 10% of the sampling unit).

Methodology used: the methodology is only limited to quantitative method of research adopted with descriptive statistics, correlation and econometrics analysis tools.

1.6 Limitations of the Study

The sample size for this study may not be large enough to study the issue and to represent the study population, for the very reason that, the problem of getting complete financial information for the study period. Moreover, the financial managers of the sample manufacturing private limited company were not interested to give primary information about the issue under investigation.

1.7 Organization of The paper

This research paper consists of five chapters. The first chapter presented Background of the Study. Statement of the Problem, Objectives of the Study, Significance of the Study. Scope of the Study and Limitations of the Study. Discussion in chapter two focuses on literature review of important concepts that are relevant to the study. The third chapter of the study deals with the methodology of the study (i.e. Research Design, Data Source and Collection Methods. Sampling Design. Method of Data Analysis and Description of Variables and Research Hypotheses). The fourth chapter consists data presentation, analysis and interpretation elements of the study. Finally, the last chapter attempt to generalize and recommend possible solutions to the problems.

Chapter Two

Literature review

2.1. Definition and Concept of Working Capital

The term working capital originated with the old Yankee peddler, who would load up his wagon with goods and then go off on his route to peddle his wares (Brigham and Gapenski, 1996). The merchandise was called working capital because it was what he actually sold, or turned over, to produce the profits. The wagon and horse were the fixed assets. The peddler generally owned the horse and wagon so, they are financed with equity capital. But, he borrowed the funds to buy the merchandise. These borrowings were called working capital loans, they had to be repaid after each trip to demonstrate to the bank that the credit was sound. If the peddler was able to repay the loan, then the bank would make another loan, and banks that followed this procedure were said to be employing sound banking practices.

The concept of working capital was, perhaps, first evolved by Marx (1867), though in a somewhat different form. Marx used the term 'variable capital' meaning outlays for payrolls advanced to workers before the goods they worked on were complete. He contrasted this with 'constant capital', which according to him, is nothing but 'dead labor', i.e. outlays for raw materials and other instruments of production produced by labor in earlier stages which are now needed live labor to work with in the present stage. This 'variable capital' was the wage fund which remains blocked in terms of financial management, in work-in-process along with other operating expenses until it is released through sale of finished goods. Although Marx did not mention that workers also gave credit to the firm by accepting periodical payment of wages which funded a portion of work-in-process, the concept of working capital, as we understand today, was embedded in his 'variable capital'.

The working capital of a business enterprise can be said as portion of its total financial resources which is put to a variable operative purpose (Brigham and Gapenski, 1996).

But with the evolution of the concept came there were controversy about the definition of working capital. Guthman and Dougall (1948) defined working capital as excess of current asses over current liabilities. This view was elaborated by Gladson (1951) when he defined working capital as the excess of current assets of a business (cash, accounts receivables, inventories, for example) over current items owed to employees and others (such as salaries and wages payables, accounts payables, taxes owed to government). This concept of working capital, as has been commonly understood by the accountants, more particularly understood as net working capital to distinguish it from gross working capital which represents total current assets (Sen and Oruc, 2009). Walker (1964) holds that this concept is useful to groups interested in determining the amount and nature of assets that may be used to pay current liabilities. These interested groups, as suggested by Walker, mostly composed of creditors, particularly the supply creditors who may be concerned to know the 'margin of safety' available to them when the realization of current assets be delayed for some reasons.

2.2. Working Capital Management

The term capital is used in deferent ways in economics and in finance (Bhattacharyya. 1987). A finance scholars looks for capital on the assets side of the balance sheet. For capital, they turn their attention to the other side of the balance sheet and never commit the mistake of adding the two together while taking the census of total capital of the business.

It is not necessary to restrict utilization of the fixed capital to finance fixed asset only; rather, to use the fixed capital to finance a part of current assets also in addition to financing fixed assets is preferred. There may also be a situation where all the fixed and current assets are financed from fixed capital only. In the latter case, the firm will have current assets but no

current liability, but we cannot say that the firm does not have any need for working capital. The firm might not desire to contract current liability, but its operations would have generated current assets which have to be funded to ensure continuity of production. This fund is, in fact, an additional fund over and above the fund required to meet working expenses of the firm.

Working capital management refers to all those decisions and activities a firm undertakes in order to manage efficiently the elements of current assets (Brigham and Gapenski, 1996; Pandey, 2007). Van-Horne and Vachowicz (2004) defined the working capital management as that aspect of financial activity that is concerned with the "safeguarding and controlling of the firm's current assets and the planning for sufficient funds to pay current bills." Management of current assets is, therefore, distinct from the management of fixed assets. But more important than this tautology is that because of the dynamism of the current assets, the finance manager has to be constantly on guard to ensure that their dynamic stability is not impaired to affect the net worth of the firm negatively. Gross current assets should, therefore, be understood by their own meaning, connotation and effect on the firms and should not mechanically equated with gross working capital just because arithmetically the two may appear to be same in a balance sheet. Besides, the funding operations of the current assets are quite distinct from the management of current assets.

Management of gross current assets and gross working capital, or simply working capital, is not one and the same. The total of projected current assets is an aggregate figure for which capital has to be raised and the two may not have any bearing on each other. The profiles of the types of capital so raised in regard to the risk opportunity for gain or loss and also the cost are different from that of current assets.

Working capital is so much in use in common language and is so much misunderstood. Even among the professional managers the controversy and confusion persist. While an accountant will regard working capital as current assets minus current liabilities and call it as net working capital, a finance manager will consider gross current assets as the working capital. Both may be true, but their concerns differ. The former's concern is arithmetical accuracy trained as he is to tally the two sides of the balance sheet. But the finance manager's concern is to find fund for each item of current assets at such costs and risks that the evolving financial structure remains balanced between the two.

2.3 Working Capital and Liquidity

According to Moyer, et al., (1998), the dual goals of working capital management are liquidity and profitability. Managing liquidity, costs related to excesses and shortages of working capital, can increase firms' profitability. Firms have to determine the individual and joint impact of the levels of short-term investment and financing on the dual objectives of working capital management. These goals imply that decisions that tend to maximize profitability tend to minimize liquidity and vice versa. Conversely, focusing almost entirely on liquidity will tend to reduce the potential profitability of the firm (Brigham and Gapenski, 1996; Eljelly, 2004; Ross, et al., 2002).

Liquidity has so far been defined as a pyramid of current assets in descending order of realisability with cash holding the top position and inventory, the last. This notion has given rise to liquidity ratios such as current ratio or quick ratio, and later to the concept of *net working capital*. The pyramid is no upside down with inventory at the top. When we examine the pipeline theory of working capital, we will find that pipeline of the productive-distributive system of an enterprise consists of only inventories which, at different stages, take on different names like work-in-progress, finished goods, accounts receivable, cash balance, etc.

Working capital structure is being so designed today in efficient organizations as to take care of this fundamental liquidity of an enterprise with zero or even negative net working capital.

Firms may have an optimal level of working capital that maximizes their value. Large inventory and a generous trade credit policy may lead to high sales. Larger inventory reduce the risk of the stock-out and trade credit may stimulate sales because it allows customers to assess product quality before paying (Deloof and Gegers, 1996; Long, et al., 1993). Because suppliers may have significant cost advantages over financial institutions in providing credit to their customers, it can also be an inexpensive source of credit for customer (Peterson and Rajan, 1997). The flip side of granting trade credit and keeping inventories is that money is locked up in working capital.

2.4 Working Capital Policies

Working capital policies refer to decisions relating to the level of current assets and the way they are financed (Ross, et al., 2000). These policies have been divided into two categories by Weinraub and Visscher (1998). A firm may adopt an aggressive working capital investment (asset management) policy with a low level of current assets as percentage of total assets. On the other hand, aggressive working capital financing policy uses high level of current liabilities as percentage of total liabilities. Excessive levels of current assets may have a negative effect on the firm's profitability whereas a low level of current assets may lead to lower level of liquidity and stock-outs resulting in difficulties in maintaining smooth operations (Van-Horne and Wachowicz, 2004). Moreover, aggressive working capital financing policy that utilize higher levels of normally lower cost short-term debt increase the risk of a short-term liquidity problem.

Therefore, more aggressive working capital policies are associated with higher return and higher risk while conservative working capital policies are concerned with the lower risk and

return (Carpenter and Johnson, 1983; Gardner, et al., 1986; Weinraub and Visscher, 1998). The main objective of working capital management is to maintain an optimal balance between each of the working capital components. Business success heavily depends on the ability of financial executives to effectively manage receivables, inventory, and payables (Filbeck and Krueger, 2005). Firms can reduce their financing costs and/or increase the funds available for expansion projects by minimizing the amount of investment tied up in current assets. Most of the financial managers' time and effort are allocated in bringing non-optimal levels of current assets and liabilities back toward optimal levels (Lamberson, 1995).

An optimal level of working capital would be the one in which a balance is achieved between risk and efficiency. It requires continuous monitoring to maintain proper level in various components of working capital i.e. cash receivables, inventory and payables etc. The optimal level of working capital is determined to a large extent by the methods adopted for the management of current assets and liabilities. It requires persistent management to maintain proper level in various components of working capital i.e. cash, receivables, inventory and payables etc. In general, current assets represent important component of total assets of a firm.

A firm may be able to reduce the investment in fixed assets by renting or leasing plant and machinery, whereas, the same policy cannot be followed for the components of working capital. The high level of current assets may reduce the risk of liquidity associated with the opportunity cost of funds that may have been invested in long-term assets. The impact of working capital policies is highly important. These profitability assumptions suggest maintaining a low level of current assets and a high proportion of Current liabilities to total liabilities. This strategy will result in a low, or conceivably negative, level of a working capital. Offsetting the profitability of this strategy, however, is the increased risk to the firm.

In determining the appropriate amount, or, level, of current assets, management must consider the trade-off between profitability and risk.

Many surveys have indicated that managers spend considerable time on day-to-day problems that involve working capital decisions. One reason for this is that current assets are short-lived investment that are continually being converted into other assets types (Rao, 1989). For example, cash is used to purchase inventory items eventually become accounts receivable when they are sold on credit; and finally, the receivable are transformed into cash when they are collected. With regard to current liabilities, the firm is responsible for paying these obligations on a timely basis. The ability to match short term obligations has only improved from a liquidation perspective and not from a going concern approach (Shulman and Dambolena, 1986). A firm's net working capital is also often used as a measure of its liquidity position. That is, it represents the risk or probability that a firm will be unable to meet its financial obligations as they come due.

Therefore, the more net working capital a firm has, the greater its ability to satisfy credits demands. Moreover, because net working capital serves as liquidity risks measure the firm's net working capital position will affect its ability to acquire debt financing. For example, commercial banks often impose minimum working capital constraint in their loan agreements with firms similarly; bond indentures may contain such restrictions. Due to the credit squeeze, the problem of working capital management has acquired special importance. The shift in the emphasis from security to purpose of advance has affected a large number of borrowers. Beside this, norms for inventory and debtors have also been laid down. To aim at a sense of discipline in the working capital management all these developments have been introduced.

2.5. Importance of Working Capital Management.

In finance literature, there is a common opinion about the importance of working capital management. Explanations about why working capital management is significant for a firm generally focus on the relationship between efficiency in working capital management and firm profitability (Afza and Nazir, 2007; Christopher and Kamalavalli, 2009; Deloof, 2003). Efficient working capital management includes planning and controlling of current liabilities and assets in a way that avoids excessive investments in current assets and prevents from working with few current assets insufficient to fulfill the responsibilities. It aims at protecting the purchasing power of assets and maximizing the return on investment.

A research by Lamberson (1989) says a lot about the importance and use of financial analysis and working capital management by small manufacturers in U.S. A questionnaire was mailed to chief financial officers of 477 small firms in the southern region of U.S. 85 percent of the respondents indicated that they use ratio analysis for financial planning on monthly basis. Working capital management was ranked important and most important by 90 percent of the respondents. The importance of working capital management for small firms was, perhaps, due to their limited access to capital markets and finance providers. Accounts receivables and inventory management among the various components of working capital were ranked the most important while cash management was ranked least important by small manufacturers.

The prime object of management is to make profit. This accomplishment in most business depends largely on the manner in which they manage their working capital. Administration of fixed assets falls within the realm of capital budgeting while the management of working capital is a continuing function which involves control of every day and flow of financial resources circulating in the company in one form or the other. In turn, these decisions are influenced by the trade-off that must be made between profitability and risk.

The success of operations of a firm is determined to a large extent by the method of administration of its current. It requires continuous management to maintain proper level in various components of working capital i.e. cash, receivables and inventory etc. In establishing proper proportions, cash and financial budget may be very useful. Sales expansion, dividend declaration, plant expansion, new product line, increased salaries and wages, rising price levels etc. put added strain on working capital maintenance. Due to the poor management and lack of management skills, business fails certainly. Shortage of working capital, so often advanced as the main cause of failure of industrial concerns, is nothing but the clearest evidence of mismanagement which is so common.

Lowering the level of investment in current assets, while still being able to support sales, would lead the firm to an increase in return on total assets. Smith (1980) first signaled the importance of the tradeoffs between the dual goals of working capital management, i.e., liquidity and profitability. To the extent that the explicit costs of short-term financing are less than those of intermediate and long-term financing, the greater the proportion of short-term debt to total debt, the higher is the profitability of the firm. From another perspective, the current assets of a typical manufacturing firm accounts for ever half of its total assets. For a distribution company, they account for even more. Excessive levels of current assets can easily result in a firm is realizing a substandard return on investment. However firms with too few current assets may incur shortages and difficulties in maintaining smooth operations (Van-Horne and Wachowicz, 2004).

For small companies current assets and liabilities are the principal source of external financing. These firms do not have access to the longer term capital markets, other than to acquire a mortgage on a building. The fast growing but a larger company also makes use of current liabilities financing. For these reasons the financial manager and staff devotes a

considerable portion of their time to working capital matters. The management of cash, marketable securities, receivable, payables, accruals, and other means of short-term financing is the direct responsibility of a financial manager, only the management of inventories is not. Moreover, these management responsibilities require continuous day to day supervision. Thus, working capital management is important, for no other reason than the proportion of the financial managers' time that must be devoted to it.

2.6 Review of Related Previous Studies

Many researchers have studied working capital from different prospective and in different Social political and economic environment. The following ones are very match related and useful for this study:

In finance literature, there is a long argument on the determinants and the risk/return tradeoff between the different working capital policies. More aggressive working capital policies are associated with higher return and higher risk while conservative working capital policies are concerned with the lower risk and return. In this regard, Belt (1979) highlighted the determinants of working capital policies and the rewards & risks of an aggressive working capital policy. The author claimed that there might be two real determinants of the level of net working capital of a firm. The first determinant is the operational aspect that describes how much liquidity is needed in the current assets of the firm whereas the second determinant is the deferability of current liabilities of the company, which is the ability to postpone or delay the payments to creditors for some period. The author also asserted that the rewards and risks of an aggressive working capital policy vary between industries and within industries. Generally, the benefits might be attained by reducing the holding costs of fast moving inventory, lower collection costs associated with lower level of receivables and somewhat less costly short-term debt. However, higher returns of an aggressive working capital policy

are often associated with risk of liquidity as well. The use of large level of current liabilities, i.e. aggressive financing policy of working capital increases the chances of financial embarrassments that can lead to corporate failure and bankruptcy.

In addition, Carpenter and Johnson (1983) empirically investigated the relationship between the level of current assets and the operating risk of firms. The sample firms included were the large firms from various industrial sectors in the United States. The sample data was collected for a period of four years i.e. 1978-1982. The regression analysis showed no significant linear relationship between the level of current assets and revenue systematic risk or operating systematic risk. However, some indications of a possible non-linear relationship were found which were not highly statistically significant.

Gentry, et al. (1990) introduced a new concept of weighted cash conversion cycle in order to examine the working capital management of firms. The weighted cash conversion cycle measures the weighted number of days the funds are tied up in the accounts receivables, accounts payables and inventories less number of days payments are deferred to suppliers of the firms where the weights are calculated by dividing the amount of cash tied up in each component of working capital by the final value of product. The proposed weighted cash conversion cycle is an aggregate measure of the amount and speed that the funds flow through working capital accounts of a firm and concentrates on the real resources committed to the total working capital process.

Lamberson (1995) studied empirically how small firms respond to changes in economic activities by changing their working capital positions and level of current assets and liabilities. Small firms were expected to increase the level of current assets and liabilities as the economy expands. The hypothesis was tested on 50 small firms in United States and the data about financial statements and economic activities was collected from Moody's

working capital investment policies were followed, they were balanced by relatively conservative working capital financing policies.

Eljelly (2004) empirically analyzed 29 Saudi joint stock companies for a period of 1996-2000 to examine the relationship between liquidity and profitability. The study used net operating income as dependent profitability measure and cash gap (cash conversion cycle) and current ratio as independent liquidity measures. The study found that the cash conversion cycle was of more importance as a measure of liquidity than the current ratio that affects profitability. A strong negative relationship has been reported between the liquidity measures and net operating income by Pearson correlation and pooled regression analysis. Moreover, the size was also affecting the profitability of firms and these results were stable over the period of study.

Another study by Teruel and Solano (2005) provided empirical evidence of impact of working capital management on profitability of small and medium sized Spanish firms. Cash conversion cycle along with its components has been taken as independent variables whereas return on assets has been used as dependent measure for profitability. The data set was consisted of 8.872 SMEs covering the period of 1996-2002 was obtained from ABADEUS database of Spain. A strong negative relationship between return on assets and cash conversion cycle along with its components i.e. days accounts receivables, days inventory and days accounts payable was indicated by correlation analysis. The multivariate regression analysis confirmed this negative relationship that shortening the cash conversing cycle, firms can generate more profits for shareholders. The regression results were found significant for negative relation between return on assets and inventory turnover as well as days accounts receivables. However, impact of delaying payment to suppliers on return on assets remained inconclusive because it was not significant at 5 percent level of significance.

Lazaridis and Tryfonidis (2006) investigated the relationship between working capital management and corporate profitability using quarterly data of 131 firms listed at Athens Stock Exchange of Greece. Cash conversion cycle has been used as a measure of working capital management whereas gross profit has been taken as profitability measure. The size of the firms as measured by natural logarithm of sales, financial debt of firm and fixed financial assets to total assets ratio were used as control variables. Pearson correlation analysis showed a negative relationship between gross profit and cash conversion cycle as well as number of days of accounts receivables and inventory while a positive relationship between gross profit and number of days of accounts payables. In order to validate the robustness of correlation results, four regressions were run to examine the individual impact of cash conversion cycle and its components on gross profit. The regression results provides that cash conversion cycle, number of days accounts receivables and inventory were negatively while the number of days accounts payables were positively related to gross profit. All results were statistically significant at 1 percent level of significance indicating that managers can create profits by keeping current assets and current liabilities to an optimal level.

Padachi (2006) examined the trends in working capital management and its impact on firms' performance for a sample of 58 Mauritian Small Manufacturing Firms operating in five major industry groups (food and beverages, leather garments, paper products, prefabricated metal products and wood furniture) which are both registered and organized as proprietary/private companies. The relationship between working capital management and corporate profitability was investigated by using panel data analysis for the period 1998 – 2003. The trend in working capital needs and profitability of firms are examined to identify the causes for any significant differences between the industries. The dependent variable, return on total assets defined as profit before interest and tax divided by total assets, was used as a measure of profitability. The efficiency ratios, namely accounts receivable period, inventory period and

accounts payable period were used as measures of working capital. The Cash Conversion Cycle (CCC) was used as a comprehensive measure of working capital. The regressions were also include the ratio of current liabilities to total assets to measure the degree of aggressive financing policy, with a high ratio being relatively more aggressive. Sales a proxy for size (the natural logarithm of sales), the gearing ratio (financial debt/total assets), the gross working capital turnover ratio (sales/current assets) and the ratio of current assets to total assets were included as control variables in the regressions. The regression results showed that high investment in inventories and receivables is associated with lower profitability. An analysis of the liquidity, profitability and operational efficiency of the five industries showed significant changes and how best practices in the paper industry have contributed to performance. The findings also reveal an increasing trend in the short-term component of working capital financing.

Raheman and Nasr (2007) in this research, they have selected a sample of 94 Pakistani non-financial firms listed on Karachi Stock Exchange for a period of 6 years from 1999 – 2004 to investigate the effect of different variables of working capital management including the Average collection period, Inventory turnover in days, Average payment period, Cash conversion cycle and Current ratio on the Net operating profitability of Pakistani firms. Debt ratio, size of the firm (measured in terms of natural logarithm of sales) and financial assets to total assets ratio have been used as control variables. Pearson's correlation, and regression analysis (Pooled least square and general least square with cross section weight models) were used for analysis. The results showed that there was a strong negative relationship between variables of the working capital management and profitability of the firm. It means that as the cash conversion cycle increases it will lead to decreasing profitability of the firm, and managers can create a positive value for the shareholders by reducing the cash conversion cycle to a possible minimum level. A significant negative relationship between liquidity and

profitability has been founded. They also find that there was a positive relationship between size of the firm and its profitability. There was also a significant negative relationship between debt used by the firm and its profitability.

Afza and Nazir (2007) investigated the relationship between the aggressive/conservative working capital policies for seventeen industrial groups and a large sample of 263 public limited companies listed at Karachi Stock Exchange for a period of 1998-2003. Using ANOVA and Least Significant Difference (LSD) test, the study found significant differences among their working capital investment and financing policies across different industries. Moreover, rank order correlation confirmed that these significant differences were remarkably stable over the period of study. The aggressive investment working capital policies were accompanied by aggressive working capital financing policies. Finally, ordinary least square regression analysis found a negative relationship between the profitability measures of firms and degree of aggressiveness of working capital investment and financing policies. These results were further confirmed by Afza and Nazir (2008) on a longer period of time (i.e. 1998-2005) and using market measures of return. Moreover, the later study also took into consideration the impact of aggressiveness of working capital policies on the risk of firm. In conformity with Carpenter and Johnson (1983), the study found no significant relationship between the aggressiveness/conservativeness of working capital policies of firms and their operating and financial risk.

Ganesan (2007) tried to examine the working capital management efficiency of firms from telecommunication equipment industry in India. The relationship between working capital management efficiency and profitability is examined using correlation and regression analyses. Working capital management efficiency was measured by days sales outstanding, days inventory outstanding and days payable outstanding. Days of working capital was also

use as a comprehensive measure. The firm's profitability was measured using the operating income plus depreciation related to total assets (IA). This measure is indicator of the raw earning power of the firm's assets. Another profitability measure used for this analysis was the operating income plus depreciation related to the sales (IS). ANOVA analysis was done to study the impact of working capital management on profitability. Using a sample of 443 annual financial statements of 349 telecommunication equipment companies covering the period 2001-2007, this study found evidence that even though "days working capital" is negatively related to the profitability, it was not significantly impacting the profitability of firms in telecommunication equipment industry.

Samiloglu and Demirgunes (2008) investigated the effect of working capital management on firms' profitability for a sample of manufacturing firms listed in Istanbul Stock Exchange (ISE) for the period 1998-2007. The data was taken from the quarterly financial statements of the sampled firms from ISE database and 5,843 firm-quarter data was used. The dependent variable, firm profitability, was measured by return on assets. Accounts receivable period, inventory period and cash conversion cycle were used as proxies for working capital management policies. Like other many working capital literatures, firm size, firm growth, leverage and fixed financial assets were used as control variables. The data has been analyzed under a multiple regression model. The empirical results of the study showed that accounts receivable period, inventory period and leverage significantly negatively affect profitability of the sample firms, while firm growth (in sales) significantly and positively. However, it was also concluded that cash conversion cycle, size and fixed financial assets have no statistically significant effects on profitability of the sampled firms.

Christopher and Kamalavalli (2009) investigated the relationship between working capital management and corporate profitability for a sample of 14 corporate hospitals, in India, listed

in the Bombay Stock Exchange (BSE) for the period of 10 years (i.e. 1996/7-2005/6). The independent variables were Current Ratio, Quick Ratio, Inventory Turnover Ratio, Debtor's Turnover Ratio, Working Capital Turnover Ratio, Ratio of Current Asset to Total Asset, Ratio of Current Assets to Operating Income, Comprehensive Liquidity Index, and Net Liquid Balance. The dependent variable 'profitability' was measured in terms of Return on Investment (ROI) ratio. Size, Leverage and Growth were also used as control variables. Working capital management variables associated with ROI was examined through Correlation analysis. Impact of working capital management variables on ROI was assessed through multiple regression analysis. The most prominent variables that influence ROI were studied by employing Step-wise regression analysis. Direct and indirect effect of selected variables on ROI was analyzed through Path analysis. Correlation analysis reveals that eight variables (inventory turnover ratio, debtors turnover ratio, working capital turnover ratio, current assets to total assets ratio, comprehensive liquidity index, net liquid balance, growth rate and size) were significantly positively associated with ROI. From regression analysis it is evident that an increase of one unit in current ratio, cash turnover ratio, current assets to operating income and leverage decreases profitability. Current ratio, quick ratio, cash turnover ratio, current assets to operating income and leverage were showed negative association with return on investment. Step wise regression analysis has identified seven prominent variables (cash turnover ratio, leverage, debtors turnover ratio, size, current ratio, growth rate and quick ratio) that were significantly influence profitability. Path analysis showed 'quick ratio' has the highest direct effect on profitability while 'current ratio' has the least direct effect.

Nobanee (2009) examined the relationship between working capital management and firm's profitability for a sample of 5802 non-financial firms listed in the New York Stock Exchange, American Stock Exchange, NASDAQ Stock Market and the Over the Counter Market for the

period of 1990-2004 (87030 firm-year observations). To measure working capital management efficiency, optimal cash conversion cycle which is an additive function of optimal inventory conversion period, optimal receivable collection period and optimal payable deferral period was used. Profitability was measured by operating income to sales ratio. To investigate the relationships between chosen variables a Generalized Method of Moment System Estimation (GMM) applied to dynamic panel data. In contrast with other findings, the estimated coefficients showed that the length of the cash conversion cycle, the length of the receivable collection period and the length of the inventory conversion period had positive impact rather than negative impact on the company's profitability. The results also showed that the payable deferral period had significant negative impact on profitability instead of having a positive impact as reported on other existing literatures. In addition, the results showed that an increase in the quick ratio was negatively associated with firm's profitability, this result certify the traditional trade off between profitability and liquidity. Finally, this study was suggested an optimal cash conversion cycle as more accurate and comprehensive measure of working capital management that maximizes sales, profitability and market value of firms.

Zariyawati, et al. (2009) examined the relationship between working capital management and firm profitability for a sample of 148 firms listed in Bursa Malaysia. This study was used panel data of 1628 firm-year for the period of 1996-2006 that consist of six different economic sectors. Cash conversion cycle was used as measure of working capital management. The coefficient results of Pooled OLS regression analysis was provide a strong negative significant relationship between cash conversion cycle and firm profitability. This reveals that reducing cash conversion period results to profitability increase. Like most of other working capital literatures, this study was also suggested that, in purpose to create

shareholder value, firm manager should concern on shorten of cash conversion cycle till optimal level is achieved.

In Africa, a little work has been found in finance literature, specifically with reference to short-term financial management and working capital. In this regard, Smith and Begemann (1997) examined the tradeoff between the liquidity and profitability of firm by investigating the association between return on investment and alternative measures of working capital. The study evaluated the association between traditional and alternative working capital measures and return on investment (ROI), specifically in industrial firms listed on the Johannesburg Stock Exchange (JSE) for a period of 1984 to 1993. The problem under investigation was to establish whether the more recently developed alternative working capital concepts showed improved association with return on investment to that of traditional working capital ratios or not. Results indicated that there were no significant differences amongst the years with respect to the independent variables. The results of their step-wise regression corroborated that total current liabilities divided by funds flow accounted for most of the variability in Return on Investment (ROI). The statistical test results showed that a traditional working capital leverage ratio, current liabilities divided by funds flow, displayed the greatest associations with return on investment. Well known liquidity concepts such as the current and quick ratios registered insignificant associations whilst only one of the newer working capital concepts, the comprehensive liquidity index, exhibited strong negative correlation with return on investment as 5 percent level of significance.

A study by Enyi (2005) examined the relationship between the operational size of the firm and the adequacy of the working capital requirements in Nigeria. Relative solvency ratio has been used to measure the level of working capital that can be considered adequate for the firm size and operational level. A relative solvency ratio greater than one was considered to

be adequate for working capital level requirements relative to the operational size of the firms. The data has been collected from the annual published reports of 25 companies listed in Nigeria Stock Exchange together with the interviews of selected officials of the firms. T-test has been applied to compare the relative solvency ratio and return on capital employed as the performance measure of firms having relative solvency ratio greater than one with those that were less than one. The results indicated that firms having relative solvency ratio greater than 1 i.e. adequate working capital relative to its operational size perform better than firms who have inadequate working capital.

Falope and Ajilore (2009) provided empirical evidence about the effects of working capital management on firms' profitability by using secondary data sources from annual reports and financial statements of a sample of 50 non-financial firms listed in Nigerian Stock Exchange for the time period 1996-2005. The dependent variable, firms' profitability, was measured by return on assets, defined as net income divided by average book value of assets. With regards to the independent variables, number of days of accounts receivable, number of days of inventory, number of days of accounts payable and cash conversion cycle were used to measure working capital management. Size (defined as logarithm of assets), sales growth, debt and economic cycle (annual GDP growth rate) were also used as control variables. The study utilized panel data econometrics in a pooled regression with fixed effect models, where time-series and cross-sectional observations were combined and estimated. Significant negative relationship was found between profitability and average collection period, inventory turnover in days, average payment period and cash conversion cycle. According to the researchers, a negative relationship between number of days of accounts payable and profitability was consistent with the view that less profitable firms wait longer to pay their bills. In this case, profitability affects the account payables and vice versa. Furthermore, the study found no significant variations in the effects of working capital management between

large and small firms. Finally, the researchers were suggested that managers can create value for their shareholders if they manage their working capital in more efficient ways by reducing the number of days of accounts receivable and inventories to a reasonable minimum.

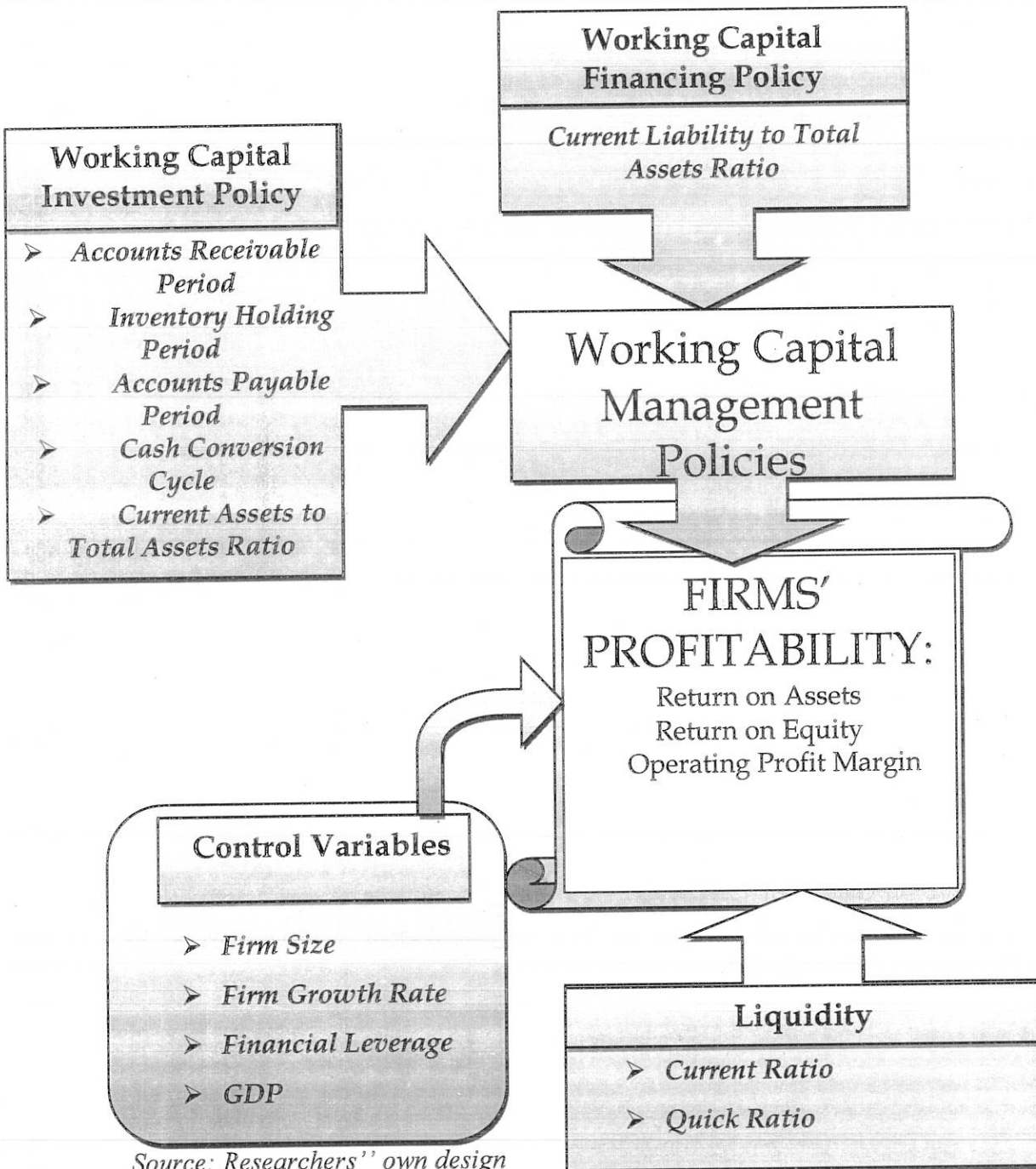
Another study by Mathuva (2009) investigated the impact of working capital management components (average collection period, inventory conversion period, and average payment period) on corporate profitability measured by the net operating profit for a sample of 30 firms listed on Nairobi Stock Exchange (NSE) for the periods 1993 to 2008. Both the pooled OLS and the fixed effects regression models were used. The key findings from the study were: (1) there exists a highly significant negative relationship between the time it takes for firms to collect cash from their customers (accounts collection period) and profitability. This means that more profitable firms take the shortest time to collect cash from their customers; (2) there exists a highly significant positive relationship between the period taken to convert inventories into sales (the inventory conversion period) and profitability. This means that firms which maintain sufficiently high inventory levels reduce costs of possible interruptions in the production process and loss of business due to scarcity of products. This reduces the firm supply costs and protects them against price fluctuations; (3) there exists a highly significant positive relationship between the time it takes the firm to pay its creditors (average payment period) and profitability. This means that the longer a firm takes to pay its creditors, the more profitable it is. Based on the findings, the management of a firm can create value for their shareholders by increasing inventories to a reasonable level, taking long to pay creditors to the optimum level and reducing the cash conversion cycle to its minimum.

Finally, to best knowledge of the researcher one research has been done by Tewodros Abera (2010) in Ethiopia. He studied the effect of working capital policy management on firms' profitability for a sample of 11 manufacturing private limited companies in Tigray region, for

the period of 2005-2009. The cash conversion cycle along with account receivable period, inventory holding period, accounts payable period, Current Liability to Total Assets Ratio and current asset to total asset ratio has been used as a comprehensive measure of working capital management, whereas current ratio and quick ratios has been used as a measure of corporate liquidity. For profitability measurement Return on Assets, Return on Equity and Operating Profit Margin were used .In addition, Firm Size, Firm Growth Rate, Financial Leverage and GDP were introduced as control variables. Using correlation and pooled panel data regression models of cross-sectional and time series data he found a strong negative relationship between profitability measures and account receivable period, inventory holding period and cash conversion cycle at the 1 percent significance level. Similarly, the correlation analysis shows that accounts payable period is negatively related to the three measures of profitability but this relationship is not statistically significant. On the other hand, current assets to total assets ratio shows strong positive relationship with return on assets, return on equity and operating profit margin at the 10 percent, 5 percent and 1 percent significance levels respectively. On basis of these results he suggested that managers can create value for shareholders by maintaining the cash conversion cycle and its components to an optimal level.

2.7 Conceptual Framework of the study

From the literature review, which is discussed above, the researcher construct the following conceptual frame work for the analysis of the problem.



Source; Researchers' own design
Figure 2.1 Conceptual frame work of the study

Chapter Three

Research Methodology

3.1. Research Design

The explanatory type of study with quantitative approach is employed to analyse the collected data. The research design, used in this study is a pooled panel data analysis of cross-sectional and time series data. Pooled panel data analysis, also called the constant coefficients model is one where both intercepts and slopes are constant, where the cross section firm data and time series data are pooled together in a single column assuming that there is no significant cross section or temporal effects (Gujarati, 2003).

3.2. Data Source and Collection Methods

The data required for the purpose of analysis was only obtained from secondary sources, through document analyses (Financial statements of five years of sampled firms i.e. for the period 2006-2010). The researcher considers five years as a study period, because of limited number of firms having an operating life of more than five years. Most of the required data are obtained from the financial statements submitted to the Ethiopian Revenues and Customs Authority (ERCA). for income tax purpose. However, due to incompleteness of data that are obtained from ERCA some of the data are collected directly from the respective companies. Moreover this data are adjusted so that it is useful for comparison with other companies.

3.3. Sampling Design

The total population of the study is all manufacturing private limited companies located and operating within Addis Ababa. To select sample firms, the researcher employed convenience and purposive sampling. It is because of the following requirements.

The first criterion that was used to select sample units to be included in the study is holding a complete 6 years financial statement data. The data pertaining to year 2005 were only used to compute the variable growth whose indicator is change in total sales and it is used to compute the sales growth only for the year 2006 of all observations.

The researcher further conducted two stage restriction criterions to arrive at defining the study population. The study first considers the manufacturing industry sector from the business classification, i.e. agriculture, industry and service e.t.c. In doing so, the sample considers companies that are engaged in the manufacturing sector of the economy only.

Then the researcher makes the second level sample restriction that the manufacturing companies need to hold the legal status of 'Private Limited Company.

The above restrictions has made in an attempt to avoid bias that may result from, first, industrial classification i.e. since firms operating in different class of economy have different decision criteria in selecting sources of funds needed for executing investment opportunities and different working capital requirements. In order to alleviate this problem the researcher limits the study population only to those companies engaged in manufacturing industry.

Secondly, the approach followed by tax authority in collecting tax from business organizations in Ethiopia is progressive in nature. Therefore, it basically uses size of sales turnover as its criteria for categorizing business firms. Since different tax category firms have different capacity in appropriating tax shield advantage from their capital structure choice (Equity versus debt financing), in an effort to minimize this size bias, researcher will includes those firms having a legal status of private limited company only in constructing sample elements.

The researcher tried to make the sample representative of the population-manufacturing private limited companies operating in Addis Ababa. The researcher, therefore, selected and collected 22 companies' financial statements.

3.4. Data Analysis Method

Descriptive statistics is used as the first step in the analysis and it was used to describe relevant aspects of observable facts about the variables and provide detailed information about each relevant variable. At this stage, mean, standard deviation, maximum and minimum values of the required variables are computed. The obtained data was analyzed by using two quantitative analysis methods. First, Pair wise Correlation analysis is used to measure the degree of association between the dependent variables and explanatory variables. Second, linear panel data regression models are employed to analyze the causal relationships of profitability variables with working capital investment and financing policies, liquidity and control variables. "By combining time series of cross-section observations, panel data gives more informative data, more variability, less co-linearity among variables, more degrees of freedom and more efficiency" (Baltagi cited by Gujarati 2003:637). Eviews 6 software is employed for the purpose of analysis and tables are used to present the results from the analysis.

3.5. Description of Variables

To investigate the effects of working capital management policies on firms' profitability the researcher identifies key variables that indicate profitability, working capital policies, liquidity and other factors that influence profitability. The chosen variables include dependent, independent and some control variables.

3.5.1. Dependent Variables

Dependent Variables are variables that are used to measure the profitability of firms. Due to the absence of secondary market in Ethiopia it is impossible to use market indicators such as share price, only accounting measures of profitability will be used in the study. According to Ross et al (2002), *Return on Assets (ROA)*, *Return on Equity (ROE)* and *Operating Profit Margin (OPM)* are best known and most frequently used profitability measures. To set up a factual association between the operating “success” or “failure” of firms and working capital policies and to avoid the effect of tax incentives (if available), Earning Before Interest and Tax (EBIT) is used as a base to calculate ROA and OPM as follows:

$$\text{Return on Assets (ROA)} = \frac{\text{Earnings Before Interest and Tax (EBIT)}}{\text{Total Assets (TA)}}$$

$$\text{Operating Profit Margin (OPM)} = \frac{\text{Earnings Before Interest and Tax (EBIT)}}{\text{Net Sales (NS)}}$$

To measure the return to the owners' equity, earning before tax is used.

$$\text{Return on Equity (ROE)} = \frac{\text{Earnings Before Tax (EBT)}}{\text{Total Equity (TE)}}$$

3.5.2. Independent Variables

Accounts Receivable Period (ARP), Inventory Holding Period (IHP) and Accounts Payable Period (APP) as an independent variable, will be used to measure specific working capital investment policy. Furthermore, Cash Conversion Cycle (CCC) and Current Assets to Total Assets Ratio (CATAR) are used as compressive measures of working capital policy. Current Liabilities to Total Assets Ratio (CLTAR) is used as a measure of working capital financing policy whilst the two conventional measures, Current Ratio (CR) and Quick Ratio (QR), are

used as indicators of liquidity (Eljelly, 2004; Lazaridis and Tryfonidis, 2006; Padachi, 2006; Raheman and Nasr, 2007; Tewodros 2010;).

Accounts Receivable Period (ARP), also used as proxy for Collection Policy, and represents the average time it takes to gather payments from customers from sales of goods and services. The longer the accounts receivable period, the higher will be the investment in accounts receivable. Theoretically, the higher the investment in account receivable, the lower will be the profitability.

To calculate ARP the researcher uses the following formula:

$$\text{Accounts Receivable Period (ARP)} = [\text{Accounts Receivable} / \text{Sales}] \times 365 \text{ days}$$

Inventory Holding Period (IHP), is used as alternative for the Inventory Policy, and stands for the average time it takes to acquire and sell inventory. The longer the inventory storage period, the higher will be the investment in inventory. In the same manner, the higher the amount invested in inventory, the lower will be the profitability of firms.

IHP can be calculated as:

$$\text{Inventory Holding Period (IHP)} = [\text{Inventories} / \text{Purchase}] \times 365 \text{ days}$$

Accounts Payable Period (APP), is used as substitute for the Payment Policy, and represents the average time between purchases of inventory and payment for it. The higher the value, the longer it takes to settle payment commitments to suppliers and hence, the lower will be the investment in working capital.

The following formula is used to calculate Accounts Payable Period:

$$\text{Account Payable Period (APP)} = [\text{Accounts Payable} / \text{Purchases}] \times 365 \text{ days}$$

In addition, the **Cash Conversion Cycle (CCC)** and **Current Assets to Total Assets Ratio (CATAR)** were used as comprehensive measures of working capital investment policy. The

Cash Conversion Cycle (CCC) represents the average time between cash disbursement for inventory and cash collection from receivables. The theory says, the shorter the Cash Conversion Cycle (CCC), the lower will be the investment in inventories and receivables. The longer the Cash Conversion Cycle the greater the investment in current assets hence the greater the need for financing of current assets.

The formula used to calculate the Cash Conversion Cycle (CCC) is:

$$\text{Cash Conversion Cycle (CCC)} = \text{Accounts Receivable Period (ARP)} + \text{Inventory Period (IP)} - \text{Account Payable Period (APP)}$$

Current Assets to Total Assets Ratio (CATAR) represent the proportion of current assets in the total assets of the firm. The higher the value, the higher will be the investment in current assets.

It is calculated as:

$$\text{Current Assets to Total Assets Ratio (TCATAR)} = \frac{\text{Total Current Assets (TCA)}}{\text{Total Assets (TA)}}$$

To measure working capital financing policy efficiency *Current Liabilities to Total Assets* Ratio, which measures the Degree of Aggressiveness in Working Capital Financing, was used (Weinraub and Visscher, 1998; Afza and Nazir, 2007; Tewodros 2010;). Degree of Aggressiveness in working capital financing (DOAWCF) represents the extent to which the firm uses current liabilities to finance its working capital. The higher the value, the more the firm is aggressive in using current liabilities. Theoretically, aggressive working capital financing police relate with higher profitability.

The following formula was used to calculate current liabilities to total assets ratio

$$\text{Current Liabilities to Total Assets Ratio (CLTAR)} = \frac{\text{Total Current Liabilities (TCL)}}{\text{Total Assets}}$$

Liquidity, one of the two objectives of working capital management is liquidity. In this study, the researcher examines the relationship between the two objectives of working capital management policies: liquidity and profitability. Liquidity refers to the ability to meet current liabilities from available current assets. In this study the traditional measures of liquidity: **Current Ratio (CR)** and **Quick Ratio (QR)** are employed.

The formulas used to calculate Current Ratio and Quick Ratio were;

$$\text{Current Ratio (CR)} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$\text{Quick Ratio (QR)} = \frac{\text{Current Assets} - \text{Ending Inventory}}{\text{Current Liabilities}}$$

3.5.3. Control Variables

In order to have a reliable analysis of the effect of working capital management policies on profitability, it is common in working capital literature to use some control variables to account for various factors that may influence profitability of firms (Deelof, 2003; Eljelly, 2004; Lazaridis and Tryfonidis, 2006; Padachi, 2006; Afza and Nazir, 2007; Tewodros 2010;). Accordingly, together with the above working capital variables, some control variables that are specific to firms and general to the economy as a whole were taken into account in this study. *Firm Size (FS)*, *Firm Growth Rate (FGR)* and *Financial Leverage (FL)* are control variables that are specific to the firm. In order to account for Firm Size (FS), as used by different prior researchers, the natural logarithm of sales is used (Deelof, 2003; Eljelly, 2004; Padachi, 2006; Raheman and Nasr, 2007; Tewodros 2010;). As a proxy for Firm Growth Rate (FGR) change in annual sales $[(\text{Sales}_t - \text{Sales}_{t-1}) / \text{Sales}_{t-1}]$ is used. Total debt to total assets ratio was used as a proxy for Financial Leverage (FL). Finally, since change in economic conditions affect operating efficiency of firms and tend to be reflected in

firms' profitability (Lamberson 1995), *GDP Growth Rate (GDP)* of the country was also used as a control variable.

3.6. Model Specifications

As mentioned above, the effect of working capital management policies on firms' profitability was estimated by using similar quantitative models of Tewodros (2010) studies.

The general model was:

$$Y_i = \beta_0 + \sum \beta_i X_i + \epsilon_i$$

Where

Y_i = the i^{th} observation of dependent variables (ROA, ROE and OPM)

β_0 = the intercept of the equation

β_i = coefficients of X_i variables

X_i = the different independent variables

ϵ_i = the error term

When the above general model is converted into the specified Variables of this study the following regression equations were run to estimate the impact of working capital policies on the profitability of selected companies:

Inventory holding period and profitability measures:

$$ROA_i = \beta_0 + \beta_1(IHPI_i) + \beta_2(FSi) + \beta_3(FGR_i) + \beta_4(FLi) + \beta_5(GDPt) + \epsilon \dots \dots \dots (1)$$

$$ROE_i = \beta_0 + \beta_1(IHPI_i) + \beta_2(FSi) + \beta_3(FGR_i) + \beta_4(FLi) + \beta_5(GDPt) + \epsilon \dots \dots \dots (2)$$

$$OPM_i = \beta_0 + \beta_1(IHPI_i) + \beta_2(FSi) + \beta_3(FGR_i) + \beta_4(FLi) + \beta_5(GDPt) + \epsilon \dots \dots \dots (3)$$

Accounts Receivable Period and Profitability Measures:

$$\text{ROA } i = \beta_0 + \beta_1(\text{ARPi}) + \beta_2(\text{FSi}) + \beta_3(\text{FGRi}) + \beta_4(\text{FLi}) + \beta_5(\text{GDPT}) + \varepsilon \dots \dots \dots (4)$$

$$\text{ROE } i = \beta_0 + \beta_1(\text{ARPi}) + \beta_2(\text{FSi}) + \beta_3(\text{FGRi}) + \beta_4(\text{FLi}) + \beta_5(\text{GDPT}) + \varepsilon \dots \dots \dots (5)$$

$$\text{OPM } i = \beta_0 + \beta_1(\text{ARPi}) + \beta_2(\text{FSi}) + \beta_3(\text{FGRi}) + \beta_4(\text{FLi}) + \beta_5(\text{GDPT}) + \varepsilon \dots \dots \dots (6)$$

Accounts payable period and profitability measures:

$$\text{ROA } i = \beta_0 + \beta_1(\text{APPi}) + \beta_2(\text{FSi}) + \beta_3(\text{FGRi}) + \beta_4(\text{FLi}) + \beta_5(\text{GDPT}) + \varepsilon \dots \dots \dots (7)$$

$$\text{ROE } i = \beta_0 + \beta_1(\text{APPi}) + \beta_2(\text{FSi}) + \beta_3(\text{FGRi}) + \beta_4(\text{FLi}) + \beta_5(\text{GDPT}) + \varepsilon \dots \dots \dots (8)$$

$$\text{OPM } i = \beta_0 + \beta_1(\text{APPi}) + \beta_2(\text{FSi}) + \beta_3(\text{FGRi}) + \beta_4(\text{FLi}) + \beta_5(\text{GDPT}) + \varepsilon \dots \dots \dots (9)$$

Cash Conversion Cycle and Profitability Measures:

$$\text{ROA } i = \beta_0 + \beta_1(\text{CCCi}) + \beta_2(\text{FSi}) + \beta_3(\text{FGRi}) + \beta_4(\text{FLi}) + \beta_5(\text{GDPT}) + \varepsilon \dots \dots \dots (10)$$

$$\text{ROE } i = \beta_0 + \beta_1(\text{CCCi}) + \beta_2(\text{FSi}) + \beta_3(\text{FGRi}) + \beta_4(\text{FLi}) + \beta_5(\text{GDPT}) + \varepsilon \dots \dots \dots (11)$$

$$\text{OPM } i = \beta_0 + \beta_1(\text{CCCi}) + \beta_2(\text{FSi}) + \beta_3(\text{FGRi}) + \beta_4(\text{FLi}) + \beta_5(\text{GDPT}) + \varepsilon \dots \dots \dots (12)$$

Current Assets to Total Assets Ratio and Profitability Measures:

$$\text{ROA } i = \beta_0 + \beta_1(\text{CATARi}) + \beta_2(\text{FSi}) + \beta_3(\text{FGRi}) + \beta_4(\text{FLi}) + \beta_5(\text{GDPT}) + \varepsilon \dots \dots \dots (13)$$

$$\text{ROE } i = \beta_0 + \beta_1(\text{CATARi}) + \beta_2(\text{FSi}) + \beta_3(\text{FGRi}) + \beta_4(\text{FLi}) + \beta_5(\text{GDPT}) + \varepsilon \dots \dots \dots (14)$$

$$\text{OPM } i = \beta_0 + \beta_1(\text{CATARi}) + \beta_2(\text{FSi}) + \beta_3(\text{FGRi}) + \beta_4(\text{FLi}) + \beta_5(\text{GDPT}) + \varepsilon \dots \dots \dots (15)$$

Current Liabilities to Total Assets Ratio and Profitability Measures:

$$ROA_i = \beta_0 + \beta_1(CLTAR_i) + \beta_2(FSi) + \beta_3(FGR_i) + \beta_4(FL_i) + \beta_5(GDP_t) + \varepsilon \dots \dots \dots (16)$$

$$ROE_i = \beta_0 + \beta_1(CLTAR_i) + \beta_2(FSi) + \beta_3(FGR_i) + \beta_4(FL_i) + \beta_5(GDP_t) + \varepsilon \dots \dots \dots (17)$$

$$OPM_i = \beta_0 + \beta_1(CLTAR_i) + \beta_2(FSi) + \beta_3(FGR_i) + \beta_4(FL_i) + \beta_5(GDP_t) + \varepsilon \dots \dots \dots (18)$$

Current Ratio and Profitability Measures:

$$ROA_i = \beta_0 + \beta_1(CR_i) + \beta_2(FSi) + \beta_3(FGR_i) + \beta_4(FL_i) + \beta_5(GDP_t) + \varepsilon \dots \dots \dots (19)$$

$$ROE_i = \beta_0 + \beta_1(CR_i) + \beta_2(FSi) + \beta_3(FGR_i) + \beta_4(FL_i) + \beta_5(GDP_t) + \varepsilon \dots \dots \dots (20)$$

$$OPM_i = \beta_0 + \beta_1(CR_i) + \beta_2(FSi) + \beta_3(FGR_i) + \beta_4(FL_i) + \beta_5(GDP_t) + \varepsilon \dots \dots \dots (21)$$

Quick Ratio and Profitability Measures:

$$ROA_i = \beta_0 + \beta_1(QR_i) + \beta_2(FSi) + \beta_3(FGR_i) + \beta_4(FL_i) + \beta_5(GDP_t) + \varepsilon \dots \dots \dots (22)$$

$$ROE_i = \beta_0 + \beta_1(QR_i) + \beta_2(FSi) + \beta_3(FGR_i) + \beta_4(FL_i) + \beta_5(GDP_t) + \varepsilon \dots \dots \dots (23)$$

$$OPM_i = \beta_0 + \beta_1(QR_i) + \beta_2(FSi) + \beta_3(FGR_i) + \beta_4(FL_i) + \beta_5(GDP_t) + \varepsilon \dots \dots \dots (24)$$

Where:

ROA_i = Return on Assets of observation i

ROE_i = Return on Equity of observation i

OPM_i = Operating Profit Margin of observation i

$ARPi$ = Accounts Receivable Period of observation i

IHP_i = Inventory Holding Period of observation i

APP_i = Accounts Payable Period of observation i

CCC_i = Cash Conversion Cycle of observation i

$CATAR_i$ = Current Assets to Total Assets Ratio of observation i

$CLTAR_i$ = Current Liabilities to Total Assets Ratio of observation i

CR_i = Current Ratio of observation i

QR_i = Quick Ratio of observation i

FS_i = Firm Size of observation i

FGR_i = Firm Growth Rate of observation i

FL_i = Financial Leverage of observation i

GDP_t = Gross Domestic Product Growth Rate of Ethiopia for time period t

ε = error term of the model

β_0 = intercept

Chapter Four

Data Presentation and Analysis

In this chapter of the study, the panel data, which is prepared from the financial statement of the sample companies, are analyzed through EViews 6. The results from the regression and correlation analysis are represented in table and discussed.

4.1 Descriptive Statistics for the Study Variables

The descriptive statistics was compute, so that it gives detail understanding to the trend of working capital management, profitability, liquidity and other chosen variables among the sample firms and it is used as stand to give recommendations after identifying the association between the variables from correlation and regression analyses.

Table 4.1 presents some of selected descriptive statistics of the sample firms including the mean, standard deviations, minimum and maximum values of study variables for the study period. The research has employed 15 variables for the analysis purpose. Further, these 15 variables are broadly classified in to twelve independent variables and three dependent variables. Out of the twelve independent variables, six are proxies for working capital investment and financing policies of the sample firms. Two of other independent variables are used to measure liquidity. The remaining four variables are control variables, which are firm size as measured by the natural logarithm of sales, firm growth rate measured by the relative change in sales as compared to previous year, leverage of the firms and the GDP growth rate of the country.

As it is displayed in table 4.1, the mean value of return on asset is 7.8 percent and it deviates 13.6 percent to the left and right side of the mean value. Its minimum value is -19.05 percent while the maximum is 53.5 percent. The return on asset of the sample companies is averaged to 3.42percent. It deviates from the mean value to both sides by 32.32percent. The minimum

and maximum values are -96.37 percent and 102.61 percent respectively. Operating profit margin is averaged to 1.038 percent with standard deviation of 21.8 percent. It means that, on average, out of

1 birr of sales 1 cent is a profit and this figure may be varied to both (right and left of the mean value) sides by 21.8 percent. The minimum and maximum operating profit

Margin among the sample firms is -141.37 percent and 67.105percent respectively.

The average current ratio for the sample Manufacturing Private Limited Companies is 7.1.

Table 4.1: Descriptive Statistics for the Study Variables

Variable	Obs	Mean	Std.Dev.	Min	Max
ROA	110	0.078026	0.136256	-0.1905	0.5351089
ROE	110	0.034216	0.323209	-0.96377	1.02611
OPM	110	0.010377	0.218052	-1.41373	0.6710533
CR	110	7.085104	16.33927	0.438418	108.555
QR	110	4.035755	8.492207	0.193822	50.48601
ARP	110	134.31147	123.14385	0	976.1957
IHP	110	134.3504	663.4595	0	1146.4021
APP	110	98.4711	92.1352	0	742.323
CCC	110	275.1909	455.7621	-175.49	1085.0607
CATAR	110	0.597248	0.126182	0.0239498	0.873501
CLTAR	110	0.335121	0.225546	0.012397	0.897934
FS	110	18.341866	0.563537	6.890008	31.32098
FG	110	0.953282	3.408042	-0.88661	29.783803
FL	110	0.829448	0.536463	0.00680	3.5163
GDP	110	11.09322	0.73505	9.9	11.8

Source: EViews data summary statistics result based on annual reports of sample firms for the study period

which is highly greater than the preferred current ratio (as a rule of thumb it is good for the

firm to have current ratio of 2). The standard deviation is 16.34. The standard deviation shows a wide variability in current ratio among the sample companies. The minimum and the maximum values of current ratio are 0.44 and 108.6 respectively.

As it has shown in the above table (table 4.1), the mean value OF Quick ratio is 4.04, which is as well more than the standard quick ratio 1 (as a rule of thumb the preferred quick ratio is 1). The value of quick ratio can vary to both sides of the mean value by 8.49. The minimum and the maximum value of quick ratio is 0.19 and 50.49 respectively.

Likewise, the descriptive statistics for the three measures of efficiency of working capital investment policy, namely, accounts receivable period, inventory holding period and accounts payable period are also presented in the same table. Accounts receivable period, a measurement for collection policy, is averaged to 134 days for the sampled firms. The interpretation for the average of the account receivable period is that, firms in the sample wait 134 days on average to collect cash from credit sales. The Account receivable period can vary by 123 days to both sides of the mean value. The variance shows the existence of large difference in accounts receivable period among the sampled firms. The minimum and the maximum Account receivable period for the sampled firms are 0 and 976 days respectively.

The average value of Inventory holding period as a proxy for inventory policy is 207 days. This means, firms in the sample needs on average 207 days to sell inventory. As it is shown in the above table, the standard deviation of inventory holding period is 263 days. To the sample firms the inventory holding period ranges between zero and 1146 days as minimum and maximum values respectively. The maximum days of 1146 days to convert inventory into sales is a very long period.

The average value of Accounts payable period as a proxy for payment policy is 98 days. The standard deviation of account payable period for the sample firms is 92 days. The period

ranges between zero day and 742 days. The minimum value of account payable period, zero days, indicates that the firm makes no credit purchases.

Moreover, other two additional variables are used as comprehensive measures of the efficiency of working capital investment or asset management policy. Cash conversion cycle, one of the two comprehensive measures, is 275 days on average and the standard deviation is 456 days. The minimum value of -175 days shows that a firm records a large inventory turn-over and/or cash collections from credit sales before making a single payment for credit purchases. It means that the accounts receivable period and/or the inventory holding period are very short and/or the accounts payable period of the firm is very long. On the other hand, the maximum time for cash conversion period is 1085 days which is a very long period.

To the other measure of working capital investment policy, current assets to the total assets of the firms, the average is 59.7 percent. Current asset to total asset ratio measures the firms' degree of aggressiveness or conservativeness in working capital investment. The lower the amount of the investment in current assets, the more aggressive is the firm in working capital investment. It means that in the sampled firms, the amount of current assets represent, on average, 59.7 percent of the total assets invested. This amount can vary by 12.6 percent to both sides of the mean value. The minimum value of 2.39 percent, current asset to total asset ratio of the sample firms related with highly aggressive condition. Whereas, the maximum value of current assets to total assets ratio of 87.35 percent, represent the higher conservative condition in the sample firms during the study period. The average value of 59.7 percent indicates that, on average manufacturing private limited companies in Addis Ababa are highly conservative in managing their current assets.

To measure working capital financing policy, current liabilities to total assets ratio is used. It also measures the firm's degree of aggressiveness or conservativeness in financing its

working capital requirements. In contrast to current liability to total asset ratio, the higher the value of current liabilities to total assets ratio, the more aggressive is the firm in financing its working capital requirements. The lower the value of current asset to total asset ratio, the more conservative is the firm in financing its working capital through current liability. The average current liabilities proportion in financing the total assets of the sampled companies is 33.5 percent and it can deviate to both sides from the mean by 22.6 percent. The minimum value is 1.2 percent which represents the more conservative condition in working capital financing while the maximum is 89.8 percent which indicates highly aggressiveness in working capital financing. When we look at the average current assets proportion in total assets of sampled firms (59.72 percent) and the average proportion of current liabilities used in financing total assets (33.5 percent) together, the sampled firms are highly conservative in financing their working capital requirements and in their investment policy.

In addition, above table 4.1, also includes the descriptive statistics of control variables that are used in the study. The first control variable, firm size, as measured by the natural logarithm of annual sales, is averaged to 18.34 for the sampled firms and it can deviate to both sides of the mean value by 0.56. The minimum and maximum values of the firm size measured by the natural logarithm of the firms' annual sales are 6.89 and 31.32 respectively. The second control variable, firm growth rate is 95.32 percent on average, as measured by changes in annual sales. This indicates that there is lower sales growth rate among the sample firms. However, there is high deviation, 340.8 percent, from mean value of sales growth to both directions. The minimum and maximum sales growth among the sampled firms is -88.6 percent and 2978.3 percent respectively. The third control variable, financial leverage is 82.9 percent on average and it can vary by 53.64 percent to both sides of the mean value. The minimum and maximum values of financial leverage are 0.68 percent and 351.63 percent respectively. Finally; the annual GDP average growth rate of country is 11.09 percent for the

study period, i.e from 2006 to 2010. It can vary to both sides of the mean value by 0.74 percent. The lower and higher annual GDP growth rates during the study period are 9.9 percent and 11.8 percent respectively.

4.2. Correlation Analysis between profitability measures and explanatory variables.

The correlation analysis was done to examine the relationship of profitability with liquidity and the control variables. Moreover, correlation analysis was also done to evaluate the relationship between working capital assets management (investment) and financing policies, and profitability. To look at the relationship among these variables, Pearson correlation coefficients were calculated. In this section of the study the results of correlation study among the variables are presented and analyzed.

4.2.1. Correlation Analysis of profitability measures with Account Receivable Period and control variables.

Table 4.2: Relationship between Profitability with Accounts Receivable Period and Control Variables

	ROA	ROE	OPM	ARP	FS	FGR	FL
ROA	1						
ROE	0.7540	1					
OPM	0.5741	0.7793	1				
ARP	-0.2592	-0.5823	-0.6185	1			
FS	0.3238	0.4291	0.3471	-0.0052	1		
FGR	-0.0428	-0.0031	-0.0036	0.0863	-0.0242	1	
FL	-0.3776	-0.4008	-0.3857	0.1263	0.2593	-0.0327	1

Source: EViews correlation results based on annual reports of sample firms

The Above table 4.2 shows the correlation coefficient among the three profitability measures, accounts receivable period and the control variables of the study. As different finance literature indicates and as it is observed in the real world, efficient working capital management is expected to improve companies' profitability. From this one should expect negative correlation between accounts receivable period and the profitability measures i.e. return on assets, return on equity and operating profit margin.

In this regard most findings of researches (by Padachi, 2006; Samiloglu and Demirgunes, 2008; Shin and Soenen, 1998; Tewodros 2010) states that, there is negative correlation between accounts receivable period and the three measures of profitability (return on equity, return on asset and operating profit margin). In agreement with these findings and theories. the above correlation Table shows negative correlation coefficient between accounts receivable period and profitability measures, i.e return on assets, return on equity and operating profit margin among Addis Ababa Manufacturing P.L.Cs. From table 4.2, one can notice that correlation coefficients of accounts receivable period with return on assets, return on equity and operating profit margin are -25.9percent, -5.823 percent and -61.85 percent respectively. It indicates that the shorter account receivable period is associated with high profitability and/or longer accounts receivable period is associated with lower profitability.

In addition, As it can be clearly seen in Table 4.2 there is a positive correlation coefficient between firm size and profitability measures of the study (i.e. return on assets, return on equity and operating profit margin). The coefficients are 32.39 percent with return on asset, 42.91 percent with return on equity and 34.71 percent with operating profit margin. Moreover, the above correlation table shows that firm growth rate is weakly and negatively related with Return on asset, Return on equity and Operating profit margin with a correlation

coefficient of -4.28 percent, -0.31 percent and -0.36 percent respectively. Likewise, financial leverage has negative correlations with return on assets and operating profit margin.

4.2.2. Correlation Analysis of Profitability Measures with Current Liabilities to Total Assets Ratio, Current Ratio, Quick Ratio and GDP

Another correlation analysis has been carried out, in order to study the relationship of profitability variables with current liabilities to total assets ratio and the two traditional measures of liquidity (i.e. current ratio and quick ratio).

If efficient working capital financing policy increases profitability, one can expect negative relationship between the measures of profitability and working capital financing policy i.e. Return on assets, return on equity and operating profit margin on one hand and current liabilities to total assets ratio on the other hand.

Table 4.3 Association of Profitability Measures with Current Liabilities to Total Assets Ratio, Current Ratio, Quick Ratio and GDP

	ROA	ROE	OPM	CLTAR	CR	QR	GDP
ROA	1						
ROE	0.7521	1					
OPM	0.5741	0.7793	1				
CLTAR	0.4289	0.3952	0.1302	1			
CR	-0.3362	-0.1727	-0.0674	-0.3961	1		
QR	-0.4360	-0.2736	-0.1344	-0.2181	0.93929	1	
GDP	0.0177	0.05097	0.0727	0.10488	0.03372	0.0566	1

Source: EViews correlation results based on annual reports of sample firms for the study period

Almost all finance literatures agreed that, there is a trade-off between liquidity and profitability; therefore one can expect negative correlation coefficient between return on asset, return on equity and operating profit margin on the one hand and the current ratio and quick ratio on the other hand.

Above, Table 4.3 presents the correlation results for the three profitability measures with current liabilities to total assets ratio, current ratio, quick ratio and GDP of the country.

According to Ross and et al (2002), there is positive relationship between the current liability to total assets ratio and the profitability variables. In harmony to this theory, the above Table 4.3 shows that, current liability to total asset ratio is positively associated with Return on asset, return on equity and operating profit margin with correlation coefficients of 42.9percent, 39.5 percent and 13.2percent with return on asset, return on equity and operating profit margin respectively.

The correlation coefficient between current liability to total asset ratio and the three profitability measures indicates that, there is weak positive relationship between degree of aggressiveness in working capital financing policy and firms' profitability. The higher the current liabilities to total assets ratio, the higher will be the degree of aggressiveness in working capital financing policy, and in turn it will make the profit higher. The firm is said to be aggressive in working capital policy when it used large amounts of current liabilities to finance its working capital requirements.

If efficiency in managing working capital investment and financing policies is related only to profitability, the issue could have been easy. However, the issue at hand is also highly related to the concept of liquidity which is quite opposite to the requirements for profitability. Put it simply, the long term success of firms, in fact, is measured by their profitability. On the other hand, their short term survival, which is the base for long term success, depends on the

availability of liquid assets to meet financial obligations on time when they are due. Therefore, in finance theories there is a trade-off between profitability and liquidity. In agreement with this theoretical framework, it was hypothesized that there is a negative relationship between profitability measures and the traditional measures of liquidity.

Moreover, the above table 4.3 shows that, there is negative relationship between liquidity, as measured by both current ratio and quick ratio, and the profitability measures. As indicated in the above table the correlation coefficients for current ratio with return on assets, return on equity and operating profit margin are -33.6 percent, -17.2percent and -6.7 percent respectively. Likewise, the correlation coefficients for quick ratio with return on assets, return on equity and operating profit margin are -43.6percent, -27.4 percent and -13.44 percent respectively. At last, GDP has a weak positive relationship with profitability measures.

4.2.3. Correlation Analysis of profitability measures with inventory holding period, Accounts Payable Period, Cash Conversion Cycle and Current asset to total Asset Ratio.

The final correlation analysis has been computed, to study the association of profitability variables of the study (i.e. return on asset, return on equity and operating profit margin) with inventory holding period, accounts payable period, cash conversion cycle and current assets to total assets ratio. If efficient working capital assets management increases profitability, one should expect negative relationship between the measures of profitability and working capital assets management variables.

Table 4.4 Relationship of Profitability Measures with Inventory Holding Period, Accounts Payable Period, Cash Conversion Cycle and Current Assets to Total Assets Ratio

	ROA	ROE	OPM	IP	APP	CCC	TCATAR
ROA	1						
ROE	0.7521	1					
OPM	0.5741	0.7793	1				
IP	-0.4422	-0.5711	-0.4668	1			
APP	-0.2396	-0.0877	-0.3235	0.066	1		
CCC	-0.5129	-0.6428	-0.5016	0.5444	-0.4125	1	
TCATAR	0.3253	0.3242	0.4535	-0.0926	-0.1402	-0.0570	1

Source: EViews correlation results based on annual reports of sample firms for the study period

According to Ross and et al (2002), there is a negative relationship between profitability measures (Return on asset, return on equity and operating profit margin) and inventory holding period. In agreement with this theory, the correlation table 4.4 above indicates that. inventory holding period is negatively correlated with return on assets, return on equity and operating profit margin. The correlation coefficients are -4.42 percent with return on assets, -5.71 percent with return on equity and -46.7 percent with operating profit margin. It shows that, there is relatively weak negative relationship between inventory holding period and firms' profitability measured by return on asset, return on equity and operating profit margin.

In this regard, the theory says that, there is positive relationship between accounts payable period and profitability as measured by return on assets, return on equity and operating profit margin. Contrary to what theory says, the correlation matrix in the above table prevail

negative relationship between accounts payable period and profitability measures. As it is shown above, Account payable period has correlation coefficients of -23.96 percent with return on assets, -8.77 percent with return on equity and -32.35 percent with operating profit margin. It shows relatively weak negative relationship between the accounts payable period and firms' profitability. The negative relationship between accounts payable period and profitability goes with the view that less profitable firms wait longer to pay their bills. In this situation, profitability may affect the accounts payable period and vice versa (Deloof, 2003; Falope and Ajilore, 2009; Raheman and Nasr, 2007).

It was also theorized that, there is negative relationship between cash conversion cycle and profitability of firms measured by return on asset, return on equity and operating profit margin. In view of that, the result of the correlation matrix in Table 4.4 indicates, the cash conversion cycle is strongly and negatively correlated with return on assets, return on equity and operating profit margin. This relationship is also proofed from the correlation coefficients of -51.29 percent with return on asset, -64.28 percent with return on equity and -50.16 percent with operating profit margin. This finding is similar with finding made by Sen and Oruc (2009), and Falope and Ajilore (2009) and Tewodros (2010).

From the theories, a negative relationship between the current assets to total assets ratio and the profitability variables was also expected. To opposite of this, the above correlation matrix in Table 4.4 shows a weak positive correlation coefficient between current assets to total assets ratio and profitability of firms' measured by return on assets, return on equity and operating profit margin. The correlation coefficients are 32.53 percent, 32.42 percent and 45.35 percent with return on asset, return on equity and operating profit margin respectively.

The result of correlation coefficient current asset to total asset ratio and profitability measures implies that, there is negative relationship between aggressiveness in working capital

investment policy and firms' profitability. As current assets to total assets ratio increases, degree of aggressiveness in working capital investment policy decreases and profitability of firms increases.

Although, the pair wise correlations give evidence for relationship between two variables; it says nothing about cause and effect relationships between the variables. So that, from the results of correlation analysis, it is difficult to say that shorter accounts receivable period leads to higher profitability or shorter accounts receivable period is a result of the higher profitability. Likewise, it is difficult to interpret the negative relationship between inventory holding period and profitability variables by stating that a higher profit is the result of shorter inventory holding period or lower profit is the result of longer inventory holding period.

As a limitation correlation analysis only shows the coefficient and the direction of relationship (whether it is positive or negative) between two variables. Another additional shortcoming of correlation analysis is that, it does not provide reliable indicators or coefficients of association in a manner which control for additional explanatory variables. This means care must be exercised when interpreting the pair wise correlation coefficients. In examining effect of some variables on the other variables, the main analysis will be derived from regression analysis that overcomes the problems of correlation analysis.

4.3. Regression Analysis of working capital management and firms' profitability.

In order to detail understands on the relationship between working capital management and firms' profitability and to further investigate the impact of management of working capital investment and financing policies on firms' profitability eighteen pooled linear panel data regression models have been run. Moreover, six additional regressions have been run to examine the relationship between firms' profitability measures (return on asset, return on

equity and operating profit margin) and the traditional measures of liquidity (current asset and quick asset).

After running each of the regression models, the test for the assumptions of Classical Linear Regression Models (CLRM) has done. According to Chris Brooks (2008); there are five assumptions of CLRM, the first assumption says the errors have zero mean ($E(u_t)=0$). The second assumptions says the variance of the error must be constant ($Var(u_t) = \sigma^2 < \infty$). The third assumption is about the errors are linearly independent of one another ($cov(u_i, u_j) = 0$). The fourth assumption says There is no relationship between the error and corresponding X variate ($cov(u_t, x_t) = 0$). Finally, the last assumption said that the error term u_t is normally distributed.

Due to the fact that, all the regression model has contain a constant term, the entire regression models satisfy the first assumption of CLRM. In addition, without making a test for the third assumption (test for auto correlation), we can say that all the regression models satisfied it. This is because, the data analysis technique is pooled cross sectional analysis the researcher can mitigate the problem by ignoring the time effect.

The test for the remaining assumptions of CLRM, the identified problems and the mitigation method used to deal with the problem with are presented with each regressions next. In addition, this section of the study also presents the regression or econometrics analysis of the effect of working capital management on firms' profitability.

4.3.1. Regression analysis for Inventory Holding Period and Profitability

To study the effect of Inventory Holding period on firms' profitability, three regressions were run. When the models were tested for the CLRM assumptions, the problems of heteroscedasticity and normality were found. The log value of the variables was used to

minimize the problem of heteroscedasticity and the square root value of inventory holding period (the main independent variable), was used to correct the problem of normality.

Below, Table 4.5 presents the result of the regressions analysis in which inventory holding period and firm size are both statistically significant at 1 percent significance level in Return on asset and return on equity, and at 5 percent significance level in Operating Profit margin. The table also shows that, firm growth rate affects only return on assets negatively at 10 percent significance level. Likewise, it is also presented financial leverage is negatively affects operating profit margin at 1 percent significance level. However, it has no significant relationships with the other two measures of profitability (return on assets and return on equity). The model also shows GDP has no significant relationship with either of the profitability measures used in this study.

Table 4.5 Casual relationship b/n Profitability Measures and Inventory Holding Period

	ROA		ROE		OPM	
	Coef. (Std. Err.)	t-value (p-value)	Coef. (Std. Err.)	t-value (p-value)	Coef. (Std. Err.)	t-value (p-value)
IHP	-.0132902 (.0025638)	-4.58 (0.002)***	-.0304329 (.0047837)	-4.51 (0.002)***	-.0265092 (.0164489)	-3.17 (0.050)**
FS	.042344 (.0078513)	4.71 (0.000)***	.0600070 (.0165291)	5.73 (0.006)***	.1461857 (.0227497)	2.38 (0.021)**
FGR	-.0007687 (.0004272)	-0.94 (0.079)*	-.0106146 (.0032101)	-0.83 (0.225)	-.0032598 (.0102263)	-0.89 (0.132)
FL	-.0906097 (.0584099)	-1.75 (0.112)	-.1638124 (.097965)	-1.25 (0.428)	-.4580804 (.2410976)	-3.49 (0.010)***
GDP	-.4577911 (2.412907)	-0.36 (0.718)	-.0326481 (4.681665)	-0.02 (0.894)	-2.631466 (2.421805)	-0.55 (0.585)
Number of obs	110		110		110	
F-statistic And P value	8.24(P=0.0001)***		7.40 (P=0.0001)***		13.21 (P=0.0000)***	
R-squared	0.3985		0.5861		0.5374	
Adj R-squared	-		-		-	
S.E. of regression	0.14333		0.26413		0.301	
*** Significant at the 1 percent Level						
** Significant at the 5 percent Level						
* Significant at the 10 percent Level						
Source: EViews regression results based on annual reports of sample firms for the study period						

In agreement with the theory, the result of the regression shows that, there is negative relationship between inventory holding period and profitability of firms. This means that inventory holding period affects return on asset, return on equity and operating profit margin negatively at 1 percent, 1 percent and 5 percent significance levels respectively. This result is similar with the findings of Folope and Ajilore (2009), Padachi (2006), Tewdros (2010).

The insinuation is that the change in inventory holding period will significantly and negatively affect profitability of the firms. This means, the shorter the firm's inventory holding period, the higher will be the profitability and vice versa.

As it is clearly revealed in table 4.5, the explanatory powers of the three models are 39.85 percent, 58.61 percent and 53.74 percent respectively. This is a signal that the variability of the variables used in the models causes 39.85 percent of the changes in the return on assets, 58.61 percent of variability in the return on equity and 53.74 percent of changes in operating profit margin. The remaining 60.15 percent changes on return on asset, 41.39 percent changes on Return on equity and 46.29 percent changes on Operating profit margin reflect the portion which is not explained by the variables included in the models. Moreover, the overall significances of the models when measured by their respective F statistics are 8.24, 7.40 and 13.21 with P-values of 0.0001, 0.0001 and 0.0000 respectively indicate that the models are well fitted at the 1 percent significance level.

4.3.2. Regression analysis for Accounts Receivable Period and Profitability measures.

To study the effect of accounts receivable period on firms' profitability, three regressions were run. After running the three models, the results were tested for the Classical linear regression model (CLRM) assumptions. Although, Models with Return on equity and operating profit margin as dependent variables were having heteroscedasticity problem, the rest of the assumptions are satisfied by the model. The log value of return on asset and operating profit margin was used to minimize the problem of heteroscedasticity.

Under table 4.6. presents the summary of the three regression models that have been run to study the effect of accounts receivable period on firms' profitability measured by return on asset, return on equity and operating profit margin.

Table 4.6: Casual relationship b/n Profitability Measures and Accounts Receivable Period

	ROA		ROE		OPM	
	Coef. (Std.Err.)	t-value (p-value)	Coef. (Std.Err.)	t-value (p-value)	Coef. (Std.Err.)	t-value (p-value)
ARP	-.132347 (.0382067)	-5.19 (0.000)***	-0.32049 (.00553)	-5.21 (0.000)***	-.0468454 (.01007)	-3.78 (0.001)***
FS	.0389997 (.0074808)	4.76 (0.000)***	0.0729736 (.0162526)	6.43 (0.000)***	.0931128 (.0246922)	3.73 (0.000)***
FGR	-.0024519 (.0014437)	-0.99 (0.065)*	-0.01326 (.0023133)	-1.87 (0.021)**	-.0123623 (.0011724)	-2.95 (0.006)***
FL	-.211591 (.0625784)	-2.43 (0.034)**	-0.189493 (.1664134)	-1.24 (0.2610)	-.3384253 (.230243)	-2.76 (0.008)***
GDP	.3340613 (2.730205)	0.197 (0.733)	2.630281 (2.304698)	1.21 (0.52)	.3441876 (4.179536)	0.08 (0.943)
Number of obs	110		110		110	
F-statistic And P value	10.11 (P=0.0000)***		19.00 (P=0.0000)***		16.21 (P=0.0000)***	
R-squared	0.5148		0.6135		0.6854	
AdjR-squared	-		-		-	
S.E. of reg	0.32518		0.3541		0.34942	

*** Significant at the 1 percent Level

** Significant at the 5 percent Level

* Significant at the 10 percent Level

Source: EViews regression results based on annual reports of sample firms for the study period

As it is clearly seen from the result of the regressions analysis, accounts receivable period and firm size are both statistically significant at the 1 percent level in all the three regressions. Firm growth rate also affects return on assets, return on equity and operating profit margin negatively and significantly at 10 percent, 5 percent and 1 percent significance levels respectively.

Likewise, financial leverage, affect return on assets and operating profit margin negatively and significantly at 5 percent and 1 percent significance levels respectively, but it has no

significant effect on the return on equity. Unlike to other variables of the regression, GDP does not have significant impact on profitability measures used in this research.

The finding by Mathuva (2009), Padachi (2006), Samiloglu and Demirgunes (2008) and Tewodros (2010) indicates, there is negative relationship between profitability measures and accounts receivable period. In agreement with these findings, all the three indicators of profitability, return on assets, return on equity, and operating profit margin, are negatively and significantly related with accounts receivable period at 1 percent significance level.

As it can be seen from above table 4.6, the explanatory power of the three models, from their respective R squared values are 51.48 percent, 61.35 percent and 68.54 percent for return on assets, return on equity and operating profit margin respectively. This implies that 51.48 percent of variability in the return on assets, 61.35 percent of variability in the return on equity and 68.54 percent of changes in operating profit margin are explained by the changes in the independent variables used in the models. However, the remaining 48.52 percent changes in return on assets, 38.65 percent variability in return on equity and 36.46 percent of changes in operating profit margin are caused by other factors that are not included in the models. Moreover, the overall significance of the models, when measured by their respective F statistics of 10.11, 19.00 and 16.21 with P-values of 0.0000, indicate that the models are well fitted at 1 percent significance level.

The implication of the above result is that, the increase or decrease in accounts receivable will significantly and negatively affect profitability of the firms. It means that the shorter the firm's accounts receivable period, the higher will be the profitability and vice versa. This is may be due to either or combination of the following two reasons.

The first reason: to minimize their loss from uncollectable accounts, firms may speed up the receivable period.

The second reason; the fund will be available for productive usage or another investment, if the firm collects its accounts receivable quickly. It means the lesser the time it takes customers to pay their bills, results more cash available to replenish the inventory.

4.3.3. Regression analysis for Accounts Payable Period and Profitability

In the same fashion, three regression models were run to analyze the effect that, accounts payable period has on the three profitability measures (returns on assets, return on equity and operating profit margin). When the models were tested for the assumptions of CLRM, Heteroscedasticity was found. To reduce this problem the log value was used.

Below, Table 4.7 reveals the results of regression models in which the impact of accounts payable period on return on assets, return on equity and operating profit margin, has been examined.

Accounts payable period has no significant impact on firms' profitability as measured by return on assets, return on equity and operating profit margin. The same table shows that, firm size has positive effect on profitability measures at 1 percent significance level with both return on asset and operating profit margin, and at 5 percent significance level on return on equity. In these models, firm growth rate affects all the three measures of profitability, return on assets, return on equity and operating profit margin, negatively and significantly at the 5 percent, 10 percent and 10 percent significance levels respectively. As it is presented in the following table, there is no significant relationship between financial leverage as well as GDP and the three measures of profitability.

Table 4.7: Casual relationship b/n Profitability Measures and Accounts Payable Period

	ROA		ROE		OPM	
	Coef. (Std. Err.)	t-value (p-value)	Coef. (Std. Err.)	t-value (p-value)	Coef. (Std. Err.)	t-value (p-value)
APP	-.0112788 (.013638)	-0.85 (0.452)	-.0112108 (.0241071)	-0.45 (0.853)	-.1365374 (.0200652)	-1.41 (0.101)
FS	.0351 (.0124358)	4.32 (0.000)***	.0833942 (.0167939)	4.15 (0.035)**	.1121606 (.1115026)	5.32 (0.000)***
FGR	-.0022359 (.0014218)	-2.73 (0.0439)**	-.0038115 (.0011638)	-1.93 (0.080)*	-.0132503 (.013192)	-2.01 (0.072)*
FL	-.2331977 (.0846491)	-1.38 (0.161)	-.3428322 (.361458)	-1.23 (0.421)	-.4622286 (.3335243)	-2.31 0.125
GDP	-.2764409 (2.101767)	-0.44 (0.719)	-.0748139 (3.370132)	-0.13 (0.724)	-2.313618 (4.123448)	-0.62 (0.726)
Number of obs	110		110		110	
F-statistic (P value)	8.05(P=0.0000)***		7.13(P=0.0000)***		21.23 (P=0.0000)***	
R-squared	0.3756		0.3236		0.4256	
Adj R-squared	-		-		-	
S.E of the regression	0.26618		0.26326		0.2154	

*** Significant at the 1 percent Level

** Significant at the 5 percent Level

* Significant at the 10 percent Level

Source: EViews regression results based on annual reports of sample firms for the study period

To the contrary of the theories and similar to the findings of Teruel and Solano (2005) and Tewodros (2010), the regression analysis in table 4.7 showed that there is negative relationship between accounts payable period and profitability of firms. Though, there is negative relationship between Accounts receivables period and firms profitability, but it is not significant.

As it can be clearly seen on Table 4.7 above, the explanatory power of the three models, from their respective R squared values, are 37.56 percent, 32.36 percent and 42.56 percent for return on asset, return on equity and operating profit margin respectively. From these one can

say that 37.56 percent of the changes in return on assets, 32.36 percent of the changes in return on equity and 42.56 percent of changes in operating profit margin are explained by the variables used in the models. on the other hand, the remaining 62.44 percent changes in return on assets, 67.64 percent variability in return on equity and 57.44 percent of changes in operating profit margin are caused by other factors that are not included in the models.

The overall significance of the models when measured by their respective F statistics of 8.05, 7.13 and 21.23 with P-values of 0.0000 indicates that the models are well fitted at 1 percent significance level.

The insignificant negative relationship between Accounts payables period and firms profitability may happen due to: -

First, if the firms make the funds at hand idle, regardless of the length of Accounts Payable period, it will not have any relationship with firms' profitability. We expect no additional profits from delaying payments for accounts payable. On the other hand, if the firms use funds available at hand for productive purpose we can expect some additional profits.

Second, most of the firms included in this study import the raw materials from abroad and make purchases on accounts may be difficult in accordance with the credit policy of the suppliers due to low bargaining power of Addis Ababa firms. In this case, there may be no significant relationship between accounts payable period and profitability.

At last, in the literature of working capital, research findings it is indicated that, accounts receivable period is related with profitability of firms both positively and negatively. (Falope and Ajilore, 2009; Lazaridis and Tryfonidis, 2006; Nobanee, 2009; Raheman and Nasr, 2007). A negative significant relationship between accounts payable period

and profitability can be explained by the benefits of early payment discounts. If these two benefits are off-set each other, There will be no significant relationship between accounts payable period and profitability of firms'. On the other hand, positive significant relationship between accounts payable period and profitability can be explained by the increased availability of funds caused by the delayed payment of accounts payable. Such funds can thus be used for productive purposes that can increase profitability

4.3.4. Regression analysis for Cash Conversion Cycle and Profitability

Likewise, another three regressions were run to analyze the effect of cash conversion cycle on the return on assets, return on equity and operating profit margin. Tests for the assumptions of CLRM were done. While making these tests, the heteroscedasticity problems were encountered and the log value of the variable was used to minimize these problems.

Below table 4.8, present the result of the regressions analysis of cash conversion cycle and firms' profitability. As it is vividly shown cash conversion cycle and firm size are significantly influence return on assets and return on equity both at 1 percent significance level, and also they affect operating profit margin at the 5 percent significance level. In the same models, firm growth rate significantly and negatively associated with all the three measures of profitability at 5 percent significance level. In addition, financial leverage showed a strong negative relationship with return on assets and operating profit margin at 10 percent and 1 percent significance levels respectively. The regressions also show that, there is no significant relationship between GDP and profitability measures.

In agreement with Ross and et al (2010); and the findings by Nobanee, 2009; Raheman and Nasr, 2007and Tewodros (2010), the study results that, there is a significant negative relationship between cash conversion cycle and profitability of firms. This means that cash

conversion cycle affects return on asset and return on equity negatively at 1 percent significance level and it also affects operating profit margin at 5 percent significance level.

Table 4.8: Casual relationship b/n Profitability Measures and Cash Conversion Cycle

	ROA		ROE		OPM	
	Coef. (Std. Err.)	t-value (P-value)	Coef. (Std. Err.)	t-value (P-value)	Coef. (Std. Err.)	t-value (P-value)
CCC	-.0001572 (.000269)	-3.013 (0.008)***	-.0013657 (.0000655)	-5.10 (0.00)***	-.0013046 (.0002364)	-3.123 (0.032)**
FS	.0121215 (.0093288)	4.21 (0.001)***	.0585496 (.0274035)	3.61 (0.007)***	.0564365 (.0335615)	3.21 (0.046)**
FGR	-.0021435 (.0013211)	-3.34 (0.034)**	-.0051126 (.0105424)	-3.16 (0.047)**	-.0.005232 (.0014227)	-3.40 (0.031)**
FL	-.2131612 (.0823291)	-2.12 (0.062)*	.272631 (2.658587)	0.13 (0.820)	-.4987009 (.1767569)	-2.82 (0.007)***
GDP	-.3480056 (1.681015)	-0.32 (0.837)	-.3156415 (.2780237)	-2.27 (0.326)	-0.997397 (4.60864)	-0.75 (0.668)
Number of obs	110		110		110	
F-statistic (P value)	8.22(P=0.0000)***		11.40 (P=0.0000)***		12.7 (P=0.0000)***	
R-squared	0.3535		0.4948		0.4865	
Adj R-squared	-		-		-	
S.E of the regression	0.14622		0.3114		0.30023	
*** Significant at the 1 percent Level						
** Significant at the 5 percent Level						
* Significant at the 10 percent Level						
Source: EViews regression results based on annual reports of sample firms for the study period						

As it is shown above in table 4.8, the explanatory power of the three models measured by their respective R squared values, are 35.35 percent for return on asset, 49.48 percent for return on equity and 48.65 percent for operating profit margin respectively. From this one can say that 35.35 percent of the changes in the return on assets, 49.48 percent of change in the return on equity and 48.65 percent of changes in operating profit margin are explained by the variables used in the models.

The remaining, 64.65 percent, 50.52 percent and 51.35 percent variability in the return on asset, return on equity and operating profit margin respectively are caused by other factors that are not included in the models. Moreover, the general significances of the models when measured by their respective F statistics of 8.22, 11.40 and 12.7 with P-values of 0.0000 indicate that the models are well fitted at 1 percent significance level.

The insinuation is that the change in cash conversion cycle will significantly and negatively affect profitability of the firms. It means that the longer firms' cash conversion cycle the lower will be the profitability or the shorter the firm's cash conversion cycle, the higher will be the profitability.

Cash conversion cycle is an additive function of accounts receivable period, inventory holding period and accounts payable period; i.e. cash conversion cycle is equal to accounts receivable period *plus* inventory holding period *minus* accounts payable period. Therefore, cash conversion cycle efficiency, means efficient management of accounts receivable period, inventory holding period and accounts payable period. By managing efficiently these three items of the firm (by making short accounts receivable period and inventory holding period and/or making long accounts payable period) managers can control the efficiency of cash conversion cycle and its impact on profitability.

4.3.5. Regression analysis for Current Assets to Total Assets Ratio and Profitability

Working capital investment policy includes management of cash and other short term assets. For this reason, we need to have another comprehensive measurement of working capital investment policy. In this study, the researcher used current assets to total assets ratio as an additional comprehensive measure of working capital investment policy.

To analyze the effect of current assets to total assets ratio on return on assets, return on equity and operating profit margin three regression models were run. Log values of variables were used to mitigate heteroscedasticity problem witnessed when testing the three regressions outputs for the Classical linear regression model (CLRM) assumptions.

Table 4.9 present the results of the regressions analysis, in which current assets to total assets ratio has shown positive impact on return on asset, return on equity and operating profit margin; but it is insignificant. On the other hand, it can be seen that firm size has positive significant influence on all measures of profitability at 1 percent significance level. Firm growth rate affects return on assets, return on equity and operating profit margin negatively and significantly at the 5 percent, 10 percent and 5 percent significance levels respectively. Likewise, financial leverage showed a strong negative relationship with return on assets and operating profit margin at 10 percent and 5 percent significance levels respectively. But GDP has no significant relationship with profitability measures.

With this regard, finance literatures said that, current assets to total assets ratio affects firms' profitability negatively and significantly. To the opposite of theories and like the findings of Lewodros (2010), the results from this study showed positive relationship between current assets to total assets ratio and firms' profitability even though the relationship is not statistically significant. The result may be acceptable because most of firms included in the study have not yet fully used their fixed production capacities. This means that if they want to increase their profitability, they have to increase their investment in current assets until they reach the cost indifference point. Keeping fixed assets constant (even decreasing through depreciation) and investing more on current assets will then result in increased current assets to total assets ratio. So, it may not be surprising to see positive relationship between current assets to total assets ratio and profitability.

Table 4.9: Casual relationship b/n Profitability Measures and Current Assets to Total Assets Ratio

	ROA		ROE		OPM	
	Coef. (Std. Err.)	t-value (P-value)	Coef. (Std. Err.)	t-value (P-value)	Coef. (Std. Err.)	t-value (P-value)
CATAR	.0179596 (.0890208)	0.18 (0.838)	.3729538 (.4074913)	1.02 (0.544)	.3362736 (.349334)	1.12 (0.247)
FS	.0508093 (.0209655)	4.65 (0.000)***	.1334431 (.0303151)	4.06 (0.004)***	.053097 (.0202532)	3.16 (0.003)***
FGR	-.002127 (.001425)	-3.27 (0.022)**	-.0110213 (.0103)	-1.96 (0.055)*	-.0032933 (.0012675)	-2.60 (0.012)**
FL	-.2353929 (.0849048)	-1.82 (0.072)*	-.1766515 (.3412673)	-0.80 (0.504)	-.4588792 (.2106716)	-2.18 (0.034)**
GDP	-.539753 (1.8843)	-0.34 (0.904)	.5051409 (4.295842)	0.20 (0.874)	-1.64169 (2.511240)	-0.51 (0.772)*
Number of obs	110		110		110	
F-statistic (P value)	7.30 (P=0.0002)***		5.82 (P=0.0010)***		13.49 (P=0.0000)***	
R-squared	0.4044		0.3287		0.4328	
Adj R-squared	-		-		-	
Root MSE	0.23562		0.43379		0.43452	

*** Significant at the 1 percent Level

** Significant at the 5 percent Level

* Significant at the 10 percent Level

Source: EViews regression results based on annual reports of sample firms for the study period

In agreement with the findings by Afza and Nasir (2007), Tewodros (2010) the positive coefficients of current assets to total assets ratio indicates a negative effect of the degree of aggressiveness of working capital investment policy on firms' profitability. It means that as current assets to total assets ratio increases, degree of aggressiveness decreases, and hence firms' profitability increases. Accordingly, aggressiveness in working capital investment policy affects the profitability of firms' negatively.

As it is also shown above in table 4.9, the explanatory powers of the three regressions as measured by their respective R squared values are 40.44 percent for return on assets, 32.87 percent for return on equity and 43.28 percent for operating profit margin.

The explanatory variables are able to explain the variability in return on assets, return on equity and operating profit margin to the extent of 40.44 percent, 32.87percent and 43.28 percent respectively. The remaining 59.56 percent variability in the return on assets, 67.13 percent variability in the return on equity and 56.72 percent of variability in operating profit margin are caused by variables that are excluded from the models. The overall significances of the three models measured by their respective F statistics of 7.30, 5.82 and 13.49 with P-values of 0.0002, 0.0010 and 0.0000 indicate that the models are well fitted at 1 percent significance level.

4.3.6. Regression analysis for Current Liabilities to Total Assets Ratio and Profitability

Working capital financing policy is also measured by the relative aggressiveness or conservativeness in using current liabilities to finance working capital assets. Therefore In measuring the effect of working capital financing policy the researcher has employed current liabilities to total assets ratio. Log values of the variables were used to mitigate the heteroscedasticity problem identified when testing the three regressions outputs for the Classical linear regression model (CLRM) assumptions.

Below, Table 4.10 present the results of the regressions analysis in which current liabilities to total assets ratio influence return on assets, return on equity and operating profit margin positively and significantly at 1 percent, 5 percent and 1 percent significance levels respectively. On the other hand, firm size is strongly and positively influences return on assets, return on equity and operating profit margin at the 1 percent significance level.

Table 4.10: Casual relationship b/n Profitability Measures and Current Liabilities to Total Assets

Ratio

	ROA		ROE		OPM	
	Coef. (Std. Err.)	t-value (P-value)	Coef. (Std. Err.)	t-value (P-value)	Coef. (Std. Err.)	t-value (P-value)
CLTAR	.4631595 (.1115135)	4.21 (0.002)***	.6301734 (.2410324)	2.61 (0.012)**	.5948474 (.211135)	2.82 (0.007)***
FS	.0342887 (.0188743)	2.61 (0.001)***	.0740215 (.0203305)	3.25 (0.002)***	.0607752 (.0171789)	3.54 (0.001)***
FGR	-.0004086 (.0004578)	-0.89 (0.377)	-.0014294 (.0013365)	-1.07 (0.290)	-.0120504 (.0010855)	-1.56 (0.126)
FL	-.20777 (.0552216)	-3.76 (0.000)***	-.3789055 (.1643432)	-2.31 (0.025)**	-.6431404 (.1532235)	-4.20 (0.000)***
GDP	-.0949818 (1.408725)	-0.07 (0.947)	.4236779 (3.984892)	0.11 (0.916)	-1.500607 (3.190837)	-0.56 (0.640)
Number of obs	110		110		110	
F-statistic (P value)	11.56(P=0.0000)***		9.74(P=0.0000)***		19.85 (P=0.0000)***	
R-squared	0.4634		0.2924		0.4031	
Adj R-squared	-		-		-	
S.E of the reg	0.21965		0.41889		0.41978	

*** Significant at the 1 percent Level

** Significant at the 5 percent Level

* Significant at the 10 percent Level

Source: EViews regression results based on annual reports of sample firms for the study period

The table also shows that, financial leverage affects return on assets, return on equity and operating profit margin negatively and significantly at 1 percent, 5 percent and 1 percent significance levels respectively. However, Firm growth rate and GDP do not have significant relationship with return on asset, return on equity and operating profit margin.

When the reliability of the models are measured by their respective R squared values, the variables included in the model explain 46.34 percent variability of return on assets, 29.24 percent variability of return on equity and 40.31 percent variability of operating profit margin. However, the remaining 53.66 percent of changes in the return on assets, 70.76 percent of variability in return on equity and 59.69 percent of changes in operating profit margin are caused by other factors that are not included in the models. Moreover, the overall significance of the models when measured by their respective F statistics of 11.56, 9.74 and 19.58 with P-values of 0.0000 indicates that the models are well fitted at 1 percent significance level.

In agreement with the finding of Tewodros (2010), the study findings witnessed that, there is a significant positive relationship between current liabilities to total assets ratio and profitability of firms measured by return on asset, return on equity and operating profit margin. This means that current liabilities to total assets ratio affect return on assets and return on equity significantly and positively at 1 percent significance level, likewise, it also affects operating profit margin at 5 percent significance level. The positive coefficients of current liabilities to total assets ratio in this study point out the positive effect of aggressive working capital financing policy on firms' profitability.

The insinuation is that the change in current liabilities to total assets ratio will significantly and positively affect return on asset, return on equity and operating profit margin. The higher the amount of current liabilities the firm uses to finance its working capital assets, the more profitable the firm will be and vice versa. This implies that there is strong positive relationship between aggressiveness in working capital financing and firms' profitability.

4.4. Trade-Off between the Two Objectives of Working Capital Management

As a final point, six regressions were run to analyze the association between the two objectives of working capital management; liquidity and profitability. Most of finance literatures narrate that, there is a trade-off between these two objectives. The meaning is that, if the liquidity position of the firm is higher, the profitability of the firm will be low or if the liquidity position of the firm is low, the profitability of the firm will be high. Therefore, these regressions were run to get empirical evidence from the sampled firms as to whether the trade-off between profitability and liquidity exists or not.

4.4.1. Current Ratio and Profitability

To analyze the effect of current ratio on return on assets, return on equity, and operating profit margin, three regressions were run. The models were tested for the assumptions of CLRM. While making these tests, problem of heteroscedasticity was found and the log value of the variable was used to mitigate the problem.

Table 4.11 vividly shows, current ratio have significant negative effect on return on asset, return on equity and operating profit margin. Likewise, financial leverage showed a significant negative relationship with return on assets, return on equity and operating profit margin at the 1 percent, 10 percent and 1 percent significance levels respectively. On the other hand, the same table also shows that, firm size has positive influence on return on assets, return on equity and operating profit margin at 1 percent significance level. However, firm growth rate and GDP have no significant impact on profitability measures.

Table 4.11: Casual relationship b/n Profitability Measures and Current Ratio

	ROA		ROE		OPM	
	Coef. (Std. Err.)	t-value (P-value)	Coef. (Std. Err.)	t-value (P-value)	Coef. (Std. Err.)	t-value (P-value)
CR	-.1790364 (.0224228)	-5.78 (0.000)***	-.2075156 (.0479784)	-3.64 (0.008)***	-.2085326 (.1296108)	-3.13 (0.006)***
FS	.1260689 (.0173796)	3.99 (0.000)***	.1611476 (.0271610)	3.98 (0.000)***	.0727205 (.0241687)	3.99 (0.000)***
FGR	-.0012704 (.0012519)	-2.06 (0.388)	-.0017806 (.0107534)	-2.16 (0.347)	-.0128566 (.0013573)	-1.52 (0.178)
FL	-.3227362 (.0444307)	-5.31 (0.000)***	-.4656929 (.3062409)	-2.74 (0.083)*	-.7473667 (.2693753)	-4.12 (0.003)***
GDP	-.9790647 (1.406595)	-0.94 (0.5100)	-.782008 (3.995709)	-0.26 (0.757)	-2.731796 (3.17129)	-1.23 (0.285)
Number of obs	110		110		110	
F-statistic (P value)	28.64(P=0.0000)***		14.35 (P=0.0000)***		36.24 (P=0.0000)***	
R-squared	0.7013		0.4050		0.5193	
Adj R-squared	-		-		-	
S.E of the reg	0.20544		0.41614		0.41114	

*** Significant at the 1 percent Level

** Significant at the 5 percent Level

* Significant at the 10 percent Level

Source: EViews regression results based on annual reports of sample firms for the study period

When the reliability of the models are measured by their respective R squared values, the models with return on asset, return on equity and operating profit margin are scored 70.13 percent, 40.50 percent and 51.93 percent respectively.

These means, 70.13 percent variability on return on asset, 40.50 percent variability in return on equity and 51.93 percent variability in operating profit margin are explained by the variables included in the model. The remaining 29.87 percent variability in return on asset, 59.5percent variability in return on equity and 48.07 percent change in operating profit

margin is caused by the variables, which are excluded from the model. Moreover, the overall significance of the models when measured by their respective F statistics of 28.64, 14.35 and 36.24 with P-Values of 0.0000 indicates that, the models are well fitted at 1 percent significance level.

In agreement with the findings by of Eljelly (2004), Raheman and Nasr (2007), Shin and Soenen (1998) and Tewodros (2010), the study indicates Current ratio is negatively influence return on asset, return on equity and operating profit margin at 1 percent significance level.

The insinuation of the result of the study is that, the change in current ratio will significantly and negatively affect profitability of the firms. In other words, the lower the firm's current ratio, the higher will be the profitability or the higher firms' current ratio, the lower will be the profitability.

4.4.2. Quick Ratio and Profitability

To analyze the effect of quick ratio on return on assets, return on equity, and operating profit margin, another three regressions were run. Tests for the assumptions of CLRM were also done. Log values of the variables were used so as to minimize the problem of heteroscedasticity which was observed while carrying out the tests.

Table 4.12 below, summarizes the results of the regressions analysis between quick ratio and profitability measures. It is clear that: quick ratio has significant negative effect on return on asset, return on equity and operating profit margin. Also, Firm growth rate affects negatively and significantly return on assets and operating profit margin at the 1 percent and 10 percent significance levels respectively. Likewise, financial leverage showed a strong negative relationship with return on assets and operating profit margin at the 1 percent significance level. On the other hand, the table also shows the positive significant influence that firm size

has on all profitability measures at 1 percent significance level. As it has been noticed in the previous models, in these models also, GDP has not a significant impact on profitability measures.

Table 4.12: Casual relationship b/n Profitability Measures and Quick Ratio

	ROA		ROE		OPM	
	Coef. (Std. Err.)	t-value (P-value)	Coef. (Std. Err.)	t-value (P-value)	Coef. (Std. Err.)	t-value (P-value)
QR	-.0614777 (.022386)	-5.43 (0.000)***	-.0652347 (.135496)	-2.03 (0.048)**	-.0766366 (.0283134)	-3.46 (0.009)***
FS	.0541590 (.0189190)	5.43 (0.001)***	.0816118 (.0188707)	5.65 (0.000)***	.0326845 (.0684521)	5.97 (0.000)***
FGR	-.0009178 (.0014446)	-3.25 (0.006)***	-.0024782 (.0015828)	-2.54 (0.234)	-.0123457 (.0132651)	-1.98 (0.054)*
FL	-.264145 (.0613971)	-3.85 (0.000)***	-.4178763 (.3020683)	-1.62 (0.112)	-.6200995 (.1774368)	-3.62 (0.002)***
GDP	-.662713 (2.336024)	-0.49 (0.540)	-.520075 (4.204165)	-0.32 (0.851)	-3.629185 (3.13894)	-0.81 (0.422)
Number of obs	110		110		110	
F-statistic (P value)	16.55 (P=0.0000)***		10.04 (P=0.0000)***		29.59 (P=0.0000)***	
R-squared	0.5552		0.3021		0.4567	
Adj R-squared	-		-		-	
S.E of the reg	0.22605		0.44324		0.37753	
*** Significant at the 1 percent Level						
** Significant at the 5 percent Level						
* Significant at the 10 percent Level						
Source: EViews regression results based on annual reports of sample firms for the study period						

The explanatory powers of the explanatory variables in the model as measured by their respective R squared values are 55.52 percent for return on assets, 30.21 percent for return on equity and 45.67 percent for operating profit margin. These means the independent variables of the models are able to explain the variability in return on asset, return on equity and operating profit margin to the extent of 55.52 percent 30.21 percent and 45.67 percent

respectively. The remaining 44.48 percent variability in return on asset, 69.79 percent of variability in the return on equity and 54.33 percent of variability in operating profit margin are caused by variables that are not included in the models. The overall significances of the three models when measured by their respective F statistics of 16.55, 10.04 and 29.59 with P-values of 0.0000 indicate that the models are well fitted at 1 percent significance level.

In agreement with the findings of Tewodros (2010), Quick ratio has significant negative effect on return on asset, return on equity and operating profit margin at 1 percent, 5 percent and 1 percent significance levels respectively.

The regression result implies that, the change in quick ratio will significantly and negatively affect profitability of the firms. This means that the lower the firm's quick ratio, the higher will be the profitability and vice versa.

The last two tables showed that, profitability and liquidity are inversely related among Addis Ababa Manufacturing PLCs. This means that, as liquidity of firms increases, profitability will be decreases and vice versa.

From these findings one can infer that there is a trade-off between the two objectives of working capital management-liquidity and profitability, in manufacturing private limited company which are operating in Addis Ababa.

Chapter Five

Conclusion and Recommendation

In this chapter of the study the researcher concludes what has been studied, about effect of working capital management policies on profitability of manufacturing private limited companies in Addis Ababa. In addition, based on the conclusions drawn, the researcher also forwards certain recommendations.

5.1 Conclusions

From the analysis that has made in chapter four, the researcher draws conclusions as follows:-

As findings from descriptive statics reveals, the profitability positions of private limited companies in Addis Ababa, as measured by their return on assets, return on equity and operating profit margin, are on average around 7.80 percent, 3.42 percent and 1.04 percent respectively. Whilst, their liquidity positions, as measured by the current and quick ratios, are on average around 7.08 and 4.04 respectively. Similarly, the average accounts receivable period, inventory holding period and accounts payable period are around 134 days, 134 days and 98 days respectively. On the other hand, cash conversion cycle and current assets to total assets ratio, the two comprehensive measures of working capital investment policy, are on average 275 days and 59.7 percent respectively. Current liability to total assets ratio, used as measure of working capital financing policy, is around 33.5 percent on average. On average the size of manufacturing private limited company in Addis Ababa measured by the natural logarithm of annual sales is around 18.34 , with average growth rate of 95.3 percent, even if there is a higher variation in growth rate of individual sample firms. The financial leverage of the firms, as measured by total liabilities to total assets ratio, is approximate to 71.77 percent on average.

From the Correlations Analysis, there exist moderately strong negative relationships between profitability measures and account receivable period, inventory holding period and cash conversion cycle of manufacturing private limited companies in Addis Ababa. Likewise, Account Receivables Period of manufacturing private limited companies in Addis Ababa is weakly and negatively related with the three measures of profitability.

Current assets to total assets ratio of manufacturing P.L.Cs of Addis Ababa is weakly and positively related with return on assets return on equity and operating profit margin. Therefore, there is weak negative relationship between aggressiveness in working capital investment policy and firms' profitability. As current assets to total assets ratio increases, the degree of aggressiveness in working capital investment policy decreases (working capital investment is considered to be aggressive when investment in current assets is low) and profitability of firms increases.

Similarly, there is weak positive relationship between current liabilities to total assets ratio and profitability measures of Manufacturing P.L.Cs of Addis Ababa. Therefore, it indicates that there exists a positive relationship between degree of aggressiveness in working capital financing policy and profitability among Manufacturing P.L.Cs of Addis Ababa. A firm is said to be aggressive in working capital financing policy when it uses large amounts of current liabilities relative to total sources of funds. The higher the current liabilities to total assets ratio, the higher is the degree of aggressiveness in working capital financing policy, and so is the corresponding level of profitability.

From the correlation analysis also, there is weak negative association between the two traditional measures of liquidity (Current asset and Quick asset ratios) and profitability measures of Manufacturing P.L.Cs of Addis Ababa

From the regression analysis, inventory holding period of Manufacturing P.L.C of Addis Ababa is negatively and significantly affects their profitability, as measured by return on assets, return on equity and operating profit margin. The implication is that the increase or decrease in inventory holding period will significantly and negatively affect profitability of the firms. This means that the shorter the firm's inventory holding period, the higher will be the profitability and vice versa. It can also be interpreted as, if the inventory takes more time to sell, it will adversely affect profitability.

Likewise, all the three indicators of profitability- return on assets, return on equity and operating profit margin for Manufacturing P.L.Cs of Addis Ababa are negatively and significantly affected by accounts receivable period. The implication is that the increase or decrease in accounts receivable period will significantly and negatively affect profitability of the firms. This means that the shorter the firm's accounts receivable period, the higher will be their profitability and vice versa. Thus, this result communicates that managers can increase the profitability of firms by reducing the accounts receivable period to the possible minimum level.

Accounts payable period of the firms has a negative effect on the firms' profitability. This result, however, is not significant. Therefore, profitability of Addis Ababa manufacturing P.L.Cs does not depend upon accounts payable period. The significant negative relationship between accounts payable period and profitability is consistent with the view that speeding up payments to suppliers might increase profitability of firms due to substantial discounts for quick payment.

The cash conversion cycle of manufacturing P.L.Cs of Addis Ababa is negatively and significantly affects their profitability. The implication is that the increase or decrease in cash conversion cycle will significantly and negatively affect profitability of the firms. It means

that the shorter the firm's cash conversion cycle, the higher will be the profitability and vice versa. Thus, Addis Ababa manufacturing private limited companies can increase their profitability by making their cash conversion cycle shorter to the optimal level.

Current liabilities to total assets ratio of Manufacturing P.L.Cs in Addis Ababa is positively and significantly influences their profitability, measured by their return on assets, return on equity and operating profit margin. The implication is that the increase or decrease in current liabilities to total assets ratio will significantly and positively affect profitability of Manufacturing P.L.Cs in Addis Ababa. It means that the higher the amount of current liabilities the firm uses to finance its working capital assets, the more profitable it will be. This implies that there is strong positive relationship between aggressiveness in working capital financing and the firms' profitability.

From the coefficients of the regressions, profitability variables of manufacturing P.L.C in Addis Ababa are strongly related with working capital financing policy, as measured by current liabilities to total assets ratio, than working capital investment policy. It means that working capital financing policy affects firms' profitability strongly than working capital investment policy. Addis Ababa manufacturing firms, therefore, can increase profitability by using more aggressive way of financing for their working capital requirements.

At last, both traditional measures of liquidity (current ratio and quick ratio) of Manufacturing P.L.Cs in Addis Ababa are significantly and negatively associated with measures of profitability (Return on asset, Return on Equity and operating profit margin). Addis Ababa manufacturing private limited companies can increase profitability by reducing their liquidity position at least to the standard level (2 for current ratio and 1 for quick ratio).

5.2. Recommendation

Based on the conclusions drawn above, the researcher forwards the following recommendations. In view of the fact that, most findings of this research is similar with the findings of Tewodros (2010), his recommendations also work here.

Because, it is possible to maximize the profitability of firms by speeding the inventory turnover; the finance managers of manufacturing P.L.Cs of Addis Ababa should speed up the inventory turnover rate, so that they can reduce the inventory holding period to its optimum point.

The accounts receivable period of Addis Ababa Manufacturing P.L.Cs is relatively long. Therefore, firms could administer different mechanisms to reduce their accounts receivable period as minimum as possible.

In a condition where there is a higher discount for early payments, managers should consider maximizing profitability of the firm through reduction of accounts payable period. However, the amount of the discount should be large enough to cover the opportunity cost of early payment and to make some profit.

As it is concluded above, there is negative relationship between Accounts Payable Period and Profitably of firm's measured by return on asset, return on equity and operating profit margin. To reap the advantage of maintaining high account payable period, as it is mentioned in different books, the cause of this negative relationship should be further investigated.

The average cash conversion cycle of Manufacturing P.L.C in Addis Ababa is high; it is about 275 days. Thus, it is recommended that, companies should devise a mechanism that enables them to shorten their cash conversion cycle.

Due to the fact that, profitability variables are strongly related with working capital financing policy, manufacturing private limited companies of Addis Ababa shall use more aggressive way of financing such as trade credit and short term bank loan for their working capital requirements.

At last, Managers should strive to increase firms' profitability by improving the efficiency of management of working capital investment and financing policies while, also keeping in view of the trade-off between liquidity and profitability.

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List of sampled Manufacturing purpose

N.B:- due to the confidentiality of the firms' financial reports, the researcher uses a code instead of listing their legal name below.

S.No	Name (code of the Firm)	Product	Address
1	Sample Firm A	plastic Shoes & sole	Addis Ababa
2	Sample Firm B	milk and milk product	Addis Ababa
3	Sample Firm C	office equipments	Addis Ababa
4	Sample Firm D	Textile	Addis Ababa
5	Sample Firm E	Plastic	Addis Ababa
6	Sample Firm F	cotton and flower	Addis Ababa
7	Sample Firm G	Construction Machineries	Addis Ababa
8	Sample Firm H	Cement	Addis Ababa
9	Sample Firm I	Vaseline and soap	Addis Ababa
10	Sample Firm J	Soap and Detergent	Addis Ababa
11	Sample Firm K	Leather Garment	Addis Ababa
12	Sample Firm L	Plastic Packing	Addis Ababa
13	Sample Firm M	Plastic material	Addis Ababa
14	Sample Firm N	Iron sheet	Addis Ababa
15	Sample Firm O	Food Oil	Addis Ababa
16	Sample Firm P	Garment	Addis Ababa
17	Sample Firm Q	Juice	Addis Ababa
18	Sample Firm R	Soap and detergent	Addis Ababa
19	Sample Firm S	Metal malting	Addis Ababa
20	Sample Firm T	cleaning and paper	Addis Ababa
21	Sample Firm U	Educational materials	Addis Ababa
22	Sample Firm V	pvc extrusion and aluminium	Addis Ababa

Ratios Calculated and used for analysis

Firm	year	ROA	OPM	ROE	ARP	IP	APP	CCC
A	2006	0.0605	0.1808	0.13842	15.1437	238.752	0	253.896
	2007	0.1012	0.20697	0.21861	19.4266	151.986	0	171.413
	2008	0.1114	0.28348	0.25225	22.8159	204.059	0	226.875
	2009	0.1133	0.28848	0.2567	22.8159	205.485	0	228.301
	2010	0.0981	0.26349	0.05842	0	216.585	0	236.122
B	2006	-0.0043	0.0627	0.9638	101.076	174.029	62.2967	212.808
	2007	0.0328	0.17141	0.0413	48.8206	112.62	48.8905	112.55
	2008	0.0686	0.22917	0.0979	35.2862	115.973	29.1108	122.148
	2009	0.0621	0.25606	0.08158	65.5517	158.356	0	223.907
	2010	0.0515	0.30985	0.08132	57.6202	205.923	24.8853	238.658
C	2006	-0.0013	0.0112	-0.0014	82.5387	163.615	139.58	106.574
	2007	0.0021	0.03175	0.00601	58.0961	254.267	23.5098	288.854
	2008	0.0022	0.03214	0.02599	58.8136	254.267	0	313.081
	2009	0.0026	0.0518	0.03143	69.3034	170.996	3.8919	236.407
	2010	0.0034	0.06136	0.0254	61.8535	141.979	0	203.832
D	2006	0.0169	0.02457	0.05462	0	310.225	40.9923	270.545
	2007	0.0643	0.31095	0.1844	14.2442	205.817	23.2477	196.814
	2008	0.0447	0.02838	0.10147	2.7735	266.435	20.7677	248.441
	2009	0.1029	0.25462	0.30164	36.1362	215.275	28.7492	222.662
	2010	0.5311	0.34741	1.02611	30.9043	165.364	15.0735	181.195
E	2006	0.0691	0.33791	0.10927	3.63559	232.517	16.9382	219.215
	2007	0.0711	0.32071	0.01178	77.1191	255.064	0	332.183
	2008	0.0899	0.38152	0.02544	24.0985	356.057	0	380.155
	2009	0.0715	0.44157	0.01984	140.143	363.463	2.49217	501.114
	2010	0.0677	0.48463	0.01943	192.15	341.431	21.235	512.347
F	2006	0.0614	0.24109	0.08405	976.196	1138.588	0	264.632
	2007	0.0617	0.26345	0.02768	125.497	1146.169	0	271.666
	2008	0.0696	0.2355	0.29966	76.979	197.051	0	274.03
	2009	0.0651	0.24176	0.10935	60.9073	224.421	0	285.328
	2010	0.1109	0.22129	0.10224	25.8642	151.192	673.579	496.52

Firm	year	ROA	OPM	ROE	ARP	IP	APP	CCC
G	2006	0.04032	0.17544	0.02724	0	272.507	227.059	94.2599
	2007	0.02346	0.13955	0.04043	82.181	541.725	645.075	-221.17
	2008	0.04284	0.1555	0.03398	34.9605	275.555	742.323	-1630.1
	2009	0.04163	0.17516	0.02323	77.6423	289.57	371.705	-4.4924
	2010	0.04299	0.1903	0.04073	72.3513	325.084	654.32	-175.9
H	2006	0.00799	0.09923	0.03421	72.0768	390.613	4.19174	258.498
	2007	0.00917	0.10404	0.01106	79.9839	1.4225	191.281	-109.87
	2008	0.01579	0.06665	0.0165	49.9798	130.04	7.66024	172.36
	2009	0.04998	0.18672	0.06484	56.6831	86.5801	82.4921	60.7711
	2010	0.04972	0.17943	0.0244	137.636	119.557	101.659	155.535
I	2006	0.0201	0.23376	0.01196	468.32	177.797	144.31	233.807
	2007	0.00942	0.09811	0.03224	203.982	180.078	190.871	193.189
	2008	0.00072	0.00564	0.00326	150.588	168.902	122.915	196.575
	2009	0.0164	0.21579	0.11209	252.196	280.233	171.766	360.663
	2010	0.00523	0.05249	1.01211	205.192	266.726	0	471.919
J	2006	0.02746	0.22414	0.02518	139.978	135.613	87.8994	187.691
	2007	0.05227	0.34018	0.10164	115.169	164.176	36.2459	243.099
	2008	0.02593	0.18999	0.01669	143.084	178.782	21.3845	300.481
	2009	0.05978	0.3739	0.10199	157.781	167.743	4.02452	321.499
	2010	0.02679	0.16554	0.00755	122.857	295.361	24.6757	393.543
K	2006	0.00107	0.08847	0.00129	256.299	0	200.73	-1744.4
	2007	0.00588	0.23054	0.00801	155.521	36.1787	591.62	-899.92
	2008	0.01047	0.35793	0.01371	196.063	515.766	216.328	495.501
	2009	0.02383	0.32377	0.03051	180.844	363.755	88.906	455.693
	2010	0.01952	0.2924	0.02164	70.2409	497.888	64.7376	503.391
L	2006	0.06944	0.27542	0.02278	171.357	499.77	83.1781	587.95
	2007	0.06126	0.50319	0.03144	172.289	510.243	165.874	516.657
	2008	0.21233	0.68265	0.01534	214.06	863.402	93.4012	1085.061
	2009	0.08276	0.67788	0.04746	222.554	561.656	55.5198	728.69
	2010	0.08289	0.57085	0.034216	142.824	395.152	13.7175	524.259

Firm	year	ROA	OPM	ROE	ARP	IP	APP	CCC
M	2006	0.21692	0.67105	0.31713	80.368	474.851	486.849	68.3697
	2007	0.23119	0.0108	0.0007	63.0754	340.961	491.008	-86.971
	2008	0.23594	0.01124	0.0256	124.8564	257.83	512.3	-202.61
	2009	0.33857	0.01145	0.43173	22.5349	273.688	158.004	138.219
	2010	0.27574	0.01054	0.0463	37.5387	195.948	261.085	-27.598
N	2006	0.00875	0.11072	0.01711	172.061	378.109	238.994	311.176
	2007	-0.0008	-1.4137	-0.0009	195.381	521.622	45.9101	671.093
	2008	0.02022	0.1001	0.02185	128.546	377.594	27.9088	478.232
	2009	0.02357	0.0125	0.02825	146.084	576.255	76.716	645.623
	2010	0.01534	0.2012	0.02036	186.141	743.8	142.09	787.852
O	2006	0.02305	0.1097	0.36765	197.772	36.6634	183.641	50.7953
	2007	0.04225	0.1003	0.43725	131.895	111.529	111.822	131.603
	2008	0.02422	0.08909	0.02016	111.642	157.17	126.269	142.543
	2009	0.04618	0.09536	0.02052	24.627	200.363	71.9754	153.014
	2010	0.02948	0.03387	0.02608	23.4587	80.256	42.1849	61.5298
P	2006	0.04067	0.36751	0.02808	159.652	351.098	301.581	209.168
	2007	0.04355	0.37039	0.02688	161.245	353.545	304.411	210.379
	2008	0.04643	0.37326	1.01621	162.837	355.993	307.24	211.59
	2009	0.04931	0.37614	0.01447	164.43	358.441	310.069	212.801
	2010	0.05219	0.37902	0.01327	166.022	360.888	312.898	214.012
Q	2006	0.05507	0.3819	0.03207	167.615	363.336	315.728	215.223
	2007	0.05794	0.38478	0.05086	169.208	365.784	318.557	216.434
	2008	0.06082	0.38766	0.06966	170.8	368.231	321.386	217.645
	2009	0.0637	0.39054	0.08846	172.393	370.679	324.215	218.856
	2010	0.06658	0.39341	0.00726	173.985	373.127	327.045	220.067
	R	2006	0.06946	0.39629	0.02605	175.578	375.574	329.874
	2007	0.07234	0.39917	0.14485	177.171	378.022	332.703	222.489
	2008	0.07522	0.40205	0.26365	178.763	380.47	335.533	223.7
	2009	0.0781	0.40493	0.00044	180.356	382.917	338.362	224.911
	2010	0.08098	0.40781	0.00124	181.948	385.365	341.191	226.122

Firm	year	ROA	OPM	ROE	ARP	IP	APP	CCC
S	2006	0.08386	0.11069	0.02004	183.541	387.812	34.02	227.333
	2007	0.08673	0.11357	0.03883	185.134	390.26	34.85	228.544
	2008	0.08961	0.11644	0.11763	186.726	392.708	34.679	229.755
	2009	0.09249	0.11932	0.02643	188.319	395.155	35.508	230.966
	2010	0.09537	0.1222	0.05522	189.911	397.603	35.337	232.177
T	2006	0.09825	0.02508	0.01402	191.504	400.051	35.167	233.388
	2007	0.10113	0.02796	0.01282	193.097	402.498	36.996	234.599
	2008	0.10401	0.03084	0.00161	194.689	404.946	36.825	235.81
	2009	0.10689	0.03372	0.10041	196.282	407.394	36.655	237.021
	2010	0.10977	0.0366	0.0154	197.874	409.841	36.484	238.232
U	2005	0.11264	0.13947	1.008	199.467	412.289	372.313	239.443
	2006	0.11552	0.14235	0.0021	201.06	414.737	375.142	240.654
	2007	0.1184	0.14523	0.0456	202.652	417.184	377.972	241.865
	2008	0.12128	0.14811	0.16439	204.245	419.632	380.801	243.076
	2009	0.12416	0.15099	0.28319	205.837	422.08	383.63	244.287
	2010	0.12704	0.15387	0.00199	207.43	424.527	386.459	245.498
V	2006	0.12992	0.01075	0.02078	209.023	426.975	389.289	246.709
	2007	0.1328	0.01062	0.03958	210.615	429.423	392.118	247.92
	2008	0.13568	0.01025	0.11838	212.208	431.87	394.947	249.131
	2009	0.02383	0.01077	0.03051	180.244	363.755	88.906	455.693
	2010	0.01952	0.0114	0.02464	70.7409	497.888	64.7376	503.391

company	year	CATA	CLTAR	CR	OR	FS	FGR	FL
A	2006	0.66203	0.5424	3.064	1.7236	15.9895	NA	0.5634
	2007	0.6627	0.5118	3.2487	1.9781	15.1381	0.408	0.5371
	2008	0.60147	0.5481	2.922	1.7665	15.0788	-0.1277	0.5586
	2009	0.85922	0.3199	2.6856	0.7063	15.0788	0	0.5586
	2010	0.7868	0.6119	1.2859	0.2200	15.1485	0.1741	0.6205
B	2006	0.64438	0.2013	3.201	2.4194	19.1763	NA	0.2013
	2007	0.74592	0.2057	3.6268	2.6689	19.6688	2.1076	0.2057
	2008	0.72323	0.2994	2.416	1.4313	19.9204	0.7848	0.2993
	2009	0.8735	0.2389	3.8320	2.5147	19.7959	-0.2492	0.2389
	2010	0.7625	0.1085	7.0300	4.6335	19.9213	0.3348	0.3674
C	2006	0.25712	0.087	2.9544	0.4528	15.8482	NA	0.0870
	2007	0.78552	0.6504	1.2078	0.9331	15.9959	0.4052	0.6504
	2008	0.82976	0.0493	16.821	12.995	15.9906	0.0122	0.6294
	2009	0.23605	0.1384	1.7061	1.0616	15.0713	0.2042	0.7763
	2010	0.78851	0.7811	1.0095	0.9054	15.119	0.1161	0.7811
D	2006	0.22579	0.6915	0.4384	0.1938	27.1965	NA	0.6915
	2007	0.42811	0.4931	0.8682	0.1938	24.4617	0.8158	0.6516
	2008	0.45464	0.4975	0.9139	0.225	31.32	9.7838	0.7538
	2009	0.08773	0.2507	4.3385	1.415	24.5491	0.8866	0.7303
	2010	0.37713	0.0495	108.56	40.647	24.7412	0.5563	0.7539
E	2006	0.47411	0.3674	1.2906	0.3339	27.6066	NA	0.3674
	2007	0.82678	0.3638	2.2725	1.0951	27.6399	0.0796	0.3638
	2008	0.73174	0.2835	2.5813	0.5370	28.6188	0.0473	0.2834
	2009	0.84039	0.4038	2.081	1.1735	28.7174	0.2549	0.4038
	2010	0.86442	0.4333	1.9948	1.3622	28.7753	0.1425	0.4333
F	2006	0.35473	0.5424	5.0199	3.9268	7.7654	NA	0.2699
	2007	0.13524	0.5118	10.683	8.0674	7.7654	0.142	0.2055
	2008	0.06176	0.5481	6.4091	3.4489	7.9303	0.4616	0.3017
	2009	0.05461	0.3199	2.5448	1.3326	8.045	0.3024	0.4971
	2010	0.85001	0.6119	5.1481	1.6191	8.15896	0.30004	0.27031

Firm	Year	TCATAR	CLTAR	CR	QR	FS	FGR	FL
G	2006	0.81082	0.2699	13.747	3.87412	7.51823	NA	0.40034
	2007	0.87498	0.1063	2.9862	1.01742	7.36076	-0.3041	0.41969
	2008	0.8179	0.1657	3.90745	0.8567	7.60242	0.74444	0.42092
	2009	0.02848	0.4136	2.97383	1.14053	7.61876	0.03835	0.49981
	2010	0.0252	0.1867	4.3254	1.52559	7.61229	-0.0148	0.46748
H	2006	0.28421	0.05898	1.02452	0.6498	21.5484	NA	0.1246
	2007	0.41647	0.2997	2.43845	2.43084	21.6251	0.19334	0.17079
	2008	0.63085	0.23491	14.6646	6.77827	21.8469	0.66624	0.04302
	2009	0.85065	0.34248	3.71266	2.79626	21.0366	0.54785	0.22912
	2010	0.21685	0.23702	3.66858	2.74413	21.1761	0.37865	0.33169
I	2006	0.80287	0.10054	1.7554	1.28422	7.31328	NA	0.61311
	2007	0.81519	0.17079	1.4978	1.10638	7.37544	0.15387	0.70768
	2008	0.77831	0.04302	1.34049	0.91895	7.45551	0.20246	0.77856
	2009	0.73925	0.22912	1.49327	0.89769	7.19071	0.4565	0.89216
	2010	0.63649	0.33169	0.6378	0.52235	7.29002	0.25692	0.99793
J	2006	0.67638	0.45737	1.65434	1.30797	6.89008	NA	0.50237
K	2007	0.78869	0.54426	5.85016	4.48835	18.2301	0.62091	0.48576
	2008	0.84342	0.58061	68.0335	5.486	18.1647	-0.1398	0.44457
	2009	0.79329	0.49505	23.5581	1.1749	18.299	0.36217	0.41384
	2010	0.74692	0.79793	2.56605	1.36517	18.3246	0.06084	0.43647
	2006	0.12034	0.40885	0.69701	0.69701	23.8901	NA	0.17216
L	2007	0.1165	0.13481	0.43842	0.40357	23.9002	1.38614	0.26572
	2008	0.31318	0.0124	1.32414	0.85929	23.89	0.0231	0.23652
	2009	0.6298	0.04216	2.87829	1.93688	23.2857	1.48721	0.21881
	2010	0.716	0.36902	3.44768	2.07726	23.2403	0.1198	0.20768
	2006	0.28568	0.17766	49.8653	12.9725	7.80988	NA	0.04584
M	2007	0.81234	0.26572	6.40068	3.95999	7.96185	0.41896	0.14254
	2008	0.85958	0.23652	9.31111	6.58631	7.8522	0.2231	0.41881
	2009	0.0683	0.21881	7.08426	5.05734	7.97243	0.31894	0.1508
	2010	0.02468	0.20768	0.1546	1.02454	8.1257	0.42321	0.0154

Firm	year	TCATA	CLTAR	CR	QR	FS	FGR	FL
M	2006	0.72813	0.3682	1.9774	1.4403	19.025	NA	0.4091
	2007	0.69437	0.44045	1.57651	1.21345	19.1448	0.31754	0.48938
	2008	0.85328	0.4645	1.83696	1.55818	19.2102	0.16273	0.51612
	2009	0.66801	0.1942	3.43982	2.49101	19.1574	0.1146	0.21578
	2010	0.79338	0.36401	2.17957	1.80343	19.217	0.14709	0.40445
N	2006	0.63138	0.43987	1.43537	0.77283	7.63214	NA	0.48874
	2007	0.65173	0.07611	8.56245	4.09326	7.52663	0.2157	0.08457
	2008	0.7964	0.06693	11.8988	5.6257	7.78027	0.79326	0.07437
	2009	0.85277	0.14932	5.71114	2.73788	7.72786	0.1137	0.16591
	2010	0.8722	0.2221	3.95866	1.77933	7.63522	0.1921	0.24677
O	2006	0.03449	0.82942	1.21108	1.11882	28.7307	NA	0.93731
	2007	0.31767	0.53358	2.46951	1.83311	28.6931	0.0829	0.90336
	2008	0.3939	0.79155	1.76099	1.21271	28.8139	0.32075	0.93528
	2009	0.09291	0.81351	2.57269	1.38896	28.8862	0.18091	0.9039
	2010	0.16583	0.83925	1.38913	0.50594	29.571	3.83983	0.96431
P	2006	0.69715	0.23143	9.09706	3.59331	19.638	NA	0.41176
	2007	0.69819	0.22612	9.27162	3.61797	19.634	0.0299	0.40891
	2008	0.69923	0.22081	9.34618	3.64263	19.6299	0.0873	0.40505
	2009	0.44027	0.21551	9.47075	3.66729	19.6259	0.1447	0.40319
	2010	0.44131	0.2102	9.59531	3.69194	19.6219	0.2021	0.4011
Q	2006	0.6235	0.20489	9.71987	3.7166	28.6179	NA	0.35113
	2007	0.6338	0.19458	9.84444	3.74126	28.6138	0.8435	0.35113
	2008	0.6442	0.19428	9.969	3.76592	28.6098	0.4788	0.35177
	2009	0.6546	0.18897	10.0936	3.79058	28.6058	0.114	0.38892
	2010	0.665	0.18366	10.2181	3.81524	28.6018	0.8866	0.38915
R	2006	0.6754	0.17836	10.3427	3.8399	13.5977	NA	0.3721
	2007	0.6858	0.17305	10.4673	3.86456	13.5937	0.01557	0.38015
	2008	0.6962	0.16774	10.5918	3.88922	13.5897	0.0495	0.3877
	2009	0.7066	0.16243	10.7164	3.91387	13.5857	0.1146	0.3771
	2010	0.717	0.15713	10.8409	3.93853	13.5816	0.1797	0.3771

Firm	year	TCATA	CLTAR	CR	OR	FS	FGR	FL
S	2006	0.03274	0.15182	10.9655	3.96319	7.5776	NA	0.36893
	2007	0.03378	0.14651	11.0901	3.98785	7.57357	0.52091	0.36607
	2008	0.03481	0.14121	11.2146	4.01251	7.56955	-0.1345	0.36322
	2009	0.02585	0.1359	11.3392	4.03717	7.56553	-0.7899	0.36035
	2010	0.02689	0.13059	11.4638	4.06183	7.5615	-0.4453	0.35751
T	2006	0.02793	0.12528	11.5883	4.08649	20.5575	NA	0.35455
	2007	0.02897	0.11998	11.7129	4.11115	20.5535	0.23011	0.3518
	2008	0.02501	0.11467	11.8374	4.1358	20.5494	0.27919	0.34894
	2009	0.02305	0.10936	11.962	4.16046	21.5454	0.32827	0.34609
	2010	0.02309	0.10406	12.0866	4.18512	21.5414	0.37735	0.34323
U	2005	0.02417	0.09344	12.2111	4.20978	26.5333	0.45124	0.34037
	2006	0.02521	0.01239	12.3357	4.23444	26.5293	0.52533	0.33752
	2007	0.02625	0.08283	12.4603	4.2591	26.5253	0.59942	0.33467
	2008	0.02728	0.07752	12.5848	4.28376	26.5213	0.67351	0.33182
	2009	0.02832	0.07221	12.7094	4.30842	26.5172	0.67351	0.32897
V	2010	0.02936	0.06691	12.834	4.33308	29.5132	0.68544	0.32612
	2006	0.0304	0.0616	12.9585	4.35774	29.5092	NA	0.32324
	2007	0.03144	0.05629	13.0831	4.38239	29.5052	0.18886	0.32039
	2008	0.0298	0.21881	13.2076	4.40705	29.2857	1.48721	0.31753
	2009	0.716	0.20768	2.87829	1.93688	29.2303	0.1198	0.21467
	2010	0.03274	0.15182	3.44768	2.07726	7.5776	0.17267	0.20751