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DEPARTMENT OF PROJECT MANAGEMENT

A Research on

**The relationship between Working Capital Management and
profitability in Construction Firms: A study of local Grade one
Contractors in Addis Ababa**

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Statement of declaration

I, the undersigned, declared that this final year thesis topic “The relationship between working Capital and profitability A study of Class-one local construction firms in Addis Ababa” is my original work. I have carried out this study work independently with the guidance and support of my project advisor. This study has not been submitted to any Degree/Diploma in any institutions, and that all sources of materials used for the study have been duly acknowledged.

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Statement of certification

This is to certify that **Netsanet Gizaw** has worked her final year thesis on the topic “The relation Ship between working Capital and profitability A study of Class-one local construction firms in Addis Ababa” under my supervision. To my belief, this work undertaken by **Netsanet Gizaw** is original and qualifies for submission in partial fulfillment of the requirements for the award of Degree of Masters of Project Management.

Dr. Abebaw Kassie

Date

Acknowledgements

I would like to thank God. I would like to express my heart-felt gratitude to my advisor for his invaluable and sound advice from the inception to the completion of this study. I am also indebted to, the general and financial managers of selected construction firms for their support while I was there to collect the necessary data for my study.

The last but not the least appreciation goes to my brother, my family and my husband for their assistance in my academic endeavor with support and encouragement that enable me to have a peace of mind during my entire study period.

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Acronyms

ACP: Average Collection Period

APP: Average Payment Period

CCC: Cash Conversion Cycle

COGS: Cost of Goods Sold

CR: Current Ratio

DR: Debt Ratio

EOQ: Economic Order Quantity

FAR: Fixed Asset Ratio

GOP: Gross Operation Profit

GWC: Gross Working Capital

ITID: Inventory Turnover in day

NOP: Net Operating Profit

NWC: Net Working Capital

OLS: Ordinary Least Square

ROA: Return on Asset

SG: Sales Growth

SPSS: Statistical Package for Social Science

WC: Working Capital

WCM: Working Capital Management

WCP: Working Capital Policy

FEM: Fixed Effect Model

INV.CONV: Inventory Conversion

Abstract

The objective of this study is to find the relationship between working capital management and profitability for over six years for local construction firms in Addis Ababa. Financial statement of a sample of seventeen (17) construction companies is used with the total of 102 observations. The study examined the components of working capital such as accounts receivable period, account payable period, inventory conversion period and cash conversion cycle in relation to return on assets (ROA) and net operating profit (NOP). In addition the study used firm size, financial debt ratio, fixed asset ratio as control variables. Specifically, the study used survey of documentary analysis of companies' audited financial statements. The study adopts descriptive and explanatory research design. Data were analyzed on quantitative basis using descriptive, correlation and regression analysis (fixed effect model and pooled OLS) method. Companies were selected based on simple random sampling method to give equal chance for all population and to minimize the existence of sampling biases. The key findings of the study show that firstly, there is positive and insignificant relation between average payment period and profitability measured by NOP and ROA ,the positive relationship indicates that increase in average payment period of accounts payables will result in an increase of the NOP and ROA. Secondly, there is significant and negative relation between average collection period and profitability measured by NOP and ROA which shows slow collection of account receivables is correlated with low profitability. Thirdly, there is significant and negative relation between cash conversion cycle and profitability measured by NOP and ROA. Finally there is a negative and insignificant relation between inventory conversion period and profitability. Which indicate that managers can increase profitability by shortening cash conversion cycle. In general the study recommended that firms should minimize cash conversion cycle, inventory conversion period and average collection period.

Chapter one

Introduction

1.1 Background of the Study

Over the years there have been numerous articles written about the importance of working capital management with concern to the profitability of a firm (Shin and Soenen, 1998; Deloof, 2003; Garcia-Tereul and Martinez- Solano, 2007; Rahman and Nasr, 2007; Mathuva, 2009; Dong and Su, 2010;). Various authors have conducted researches in different countries on optimally employing working capital to pursue profitability and maximizing firms' value. Deloof (2003) showed that the way working capital is managed has a significant impact on the profitability of firms. He also states that firms have to make a trade-off between liquidity and profitability. Raheman and Nasr (2007) indicated that a company has to determine the midpoint between liquidity and profitability because increasing profits at the expense of the liquidity of the firm can be harmful in terms of insolvency and bankruptcy of the firm. The above studies point out that there is a certain level of working capital requirement, which potentially maximizes a firm's returns. Accordingly, the firm's specific working capital management methods will enhance the profitability firm. Each of the researches that have been conducted in different countries found different results on how the profitability of a firm is related to working capital management. As far as known, there have been few studies on the relationship between working capital management and the profitability in construction firms in Ethiopia.

Every business needs adequate liquid resources in order to maintain day to day cash flows. It needs enough cash to pay wages and salaries as they fall due to keep its work forces and to pay creditors to ensure its supplies. Maintaining adequate working capital is not just important in the short term, sufficient liquidity must be maintained in order to ensure the survival of business in the long term as well. Even a profitable business may fail if it does not have adequate cash flows to meet its liabilities as they fall due. Therefore, when a business make investment decisions it must not only consider the financial outlay involved with acquiring new machine, but must also take account of the additional current assets that are usually involved with any activity.

Even though firms traditionally focused on long term capital budgeting and capital structure, the recent trend is that many companies across different industries focus on WCM efficiency. Efficient WCM increases firms' free cash flow, which in turn increases the firms' growth opportunities and return to shareholders. The ultimate objective of any firm is to maximize its profit; hence proper attention should be given for working capital management as it does ultimately affect the profitability of firms.

The components of working capital are inventories, accounts to be paid to suppliers, and payments to be received from customers after sales. The proportions of these components in the working capital change from time to time during the business cycle. The working capital requirements decide the liquidity and profitability of a firm and hence affect the financing and investing decisions. Lesser requirement of working capital leads to less need for financing and less cost of capital and hence availability of more cash for shareholders. However the lesser working capital may lead to lost sales and thus may affect the profitability. The management of working capital by managing the proportions of the WCM components is important to the financial health of businesses for all industries. To reduce accounts receivable, a firm may have strict collections policies and limited sales credits to its customers. This would increase cash inflow. However the strict collection policies and lesser sales credits would lead to lost sales thus reducing the profits. Maximizing account payables by having longer credits from the suppliers also has the chance of getting poor quality materials from supplier that would ultimately affect the profitability. Minimizing inventory may lead to lost sales by stock-outs. The working capital management should aim at having balanced; optimal proportions of the WCM components to achieve maximum profit and cash flow.

In general, working capital management is not only improving financial performance in today's cash-strapped and uncertain economy, but it is the question of meeting firm's day to day operation (Eljelly, 2004). Hence, it may have both negative and positive impact on firm's profitability, which in turn, has negative and positive impact on the shareholders' wealth. Therefore, it is a critical issue to know and understand the impacts of working capital management and its influence on firm's profitability.

1.2 Statement of the Problem

The construction sector is the second largest sector in Ethiopia. This sector contributes over 9.5% of the country's Gross domestic product and also one of the largest employers in the country. In 2019, it employed 1.8 million workers (Sharon Omondi 2019 report). The sector also recorded the highest growth rate in the generation of jobs in the last decade, doubling its share in total employment. It is, essential; therefore, this vital activity is nurtured for the healthy growth of the economy. The construction sector would play a crucial role in the development and has to gear itself to meet the challenges. To meet the intended investment targets in time, the current capacity of the domestic construction sector would need considerable strengthening.

Currently in Ethiopia, many contractors are unsatisfactory with shortfall in Current Assets over Current Liabilities resulting in negative Working Capital. This shortage of liquidity results in a slowing of cash flow along the contracting chain and creates payment problems for employees, subcontractors. Likewise it puts clients at risk of not having their contracts completed on time, because of this construction firms need to know the relationships that exist between working capital management and profitability of construction firms' in order to increase their profitability concerning their working capital management. This problem invokes the student researcher to conduct this study. Therefore, by keeping the above problem in mind, the study will try to find out the relationship between working capital management and firms' profitability.

1.3 Objectives of the research

The broad objective of the study is to examine the relationship between working capital management and the profitability of local construction firms in Addis Ababa. The specific objectives of the study are:

- To determine whether there is a significant relationship between the Average Collection Period and the Profitability of the firm.
- To ascertain if there is a significant relationship between the Average Payment Period and the Profitability of the firm.
- To examine if there is a significant relationship between the Cash Conversion Cycle and the Profitability of the firm
- To examine if there is a significant relationship between Inventory conversion period and the profitability of firm.

1.4 Hypothesis

In light of the above study objectives the researcher has attempted to test the hypotheses (HP). And for the entire study in order to test hypothesis, the net operating profit and return on asset are used as a measure of construction firm's profitability.

So, based on the previous studies done by other researchers in which they determine how the working capital management is related to the profitability, the following hypotheses are identified:

- ✓ H1 There is negative relation between the average collection period and firms profitability.
- ✓ H2:. There is positive relation between the average payment period and firms profitability.
- ✓ H3: There is negative relation between the cash conversion cycle and firms profitability.
- ✓ H4: There is negative relation between the inventory conversion period and firms profitability.

1.5 Scope of the Research

The scope of the study is delimited to the study title the relationship between working capital management and the profitability of local construction companies in Addis Ababa. Because the total sample sizes of the study are very large the researcher select samples using a simple random sampling method from each stratum to generalize about the population. The study took only six years of data; the reason for it was primarily due to the reliability and availability of financial information.

1.6 Limitation of the Research

The quality of the research is highly dependent on the genuine information acquired from concerned populations or companies. So that, lack of willingness and reliability of the data is the main problems face in the study process. As there is a lack of adequate financial information, it limits the study and its output. Moreover, the shortage of the latest reference books and literature on the area of Ethiopian context narrow the study output.

1.7 Significance of the Research

This research will add some insight into this issue related to Ethiopia's literature. Similarly,

- It benefits the top manager and policymakers of those selected construction companies regarding the decision on the optimum level of working capital, ways of managing it, and overall policies on working capital management in construction firms.
- It gives a clear understanding of the relation between working capital components and corporate profitability of construction firms.
- Besides, the study gives brief information for the shareholders, prospective customers, and creditors of a construction firm regarding profitability concerning efficient working capital management.
- The study will be value to future researchers and scholars as the study will add on to the existing literature and may be used by future researchers and scholars who are interested in the study area. The study will also identify the existing knowledge gap and open more areas for further study.

1.8 Organization of the Study

To implement the study this research is structured into five chapters, including the introductory Chapter one; covers the introduction to the study, the statement of the problem, the objectives of the study, research hypothesis, scope of the study, and significance of the study. Chapter two; reviews the literature related to the subject matter. It covers the introduction, theoretical or conceptual framework and review of prior studies, and chapter summary. Chapter three; which is on research methodology, covers research design population and sample, types and sources of data, instruments of data collection, and techniques of data processing and analysis. Chapter four covers data analysis and interpretation. Chapter Five contains conclusions and recommendations of the study.

Chapter Two

Literature Review

2.1 Theoretical Views of Working capital and its Management

Working capital typically means the firm's holdings of current, or short-term, assets such as cash, receivables, inventory, and marketable securities. Working capital refers to that part of a firm's capital that is required for financing short-term or current assets such as cash, marketable securities, debtors, and inventories. In other words, working capital is the amount of funds necessary to cover the cost of operating the enterprise. Working capital means the funds (i.e.; capital) available and used for day-to-day operations (i.e.; working) of an enterprise. It consists broadly of that portion of assets of a business that are used in or related to its current operations. It refers to funds that are used during an accounting period to generate a current income of a type that is consistent with a major purpose of a firm existence. (Muralikrishna B., 2012).

Working Capital Management is the administration of the firm's current asset and the financing needed to support current asset. (Horne and Wachowicz, 1998). They further said that for a sound working capital management, a firm needs to make two fundamental decisions. They are the determination of the optimal level of investment in current assets and the appropriate mix of short –term financing used to support this investment in current assets. A business concern must maintain a sound working capital position to improve the efficiency of business operation and efficient management of finance. Both excessive and inadequate working capital leads to some problems in the business concern. Excessive working capital leads to unnecessary accumulation of raw materials, it also reduce collection periods and reduce profitability. Inadequate working capital cannot buy its requirements in bulk. It reduces the overall operation of the business.(Paramasivan and Subramanian ,2009).

2.1.1 Components of working capital

To understand working capital it is better to have basic knowledge about various aspects of working capital. To start with, there are two concepts of working capital known as gross and net.

Gross working capital (GWC): Gross working capital generally deals with overall corporate assets. It is also the total cash, and cash equivalent that a business has on-hand to run the business. Cash equivalents may include inventory, account receivable and investments, on marketable securities, which may be liquidated within the calendar year (Paramasivan and Subramanian, 2009). Generally, gross working capital is simply called as the total current assets of a firm.

Net working capital (NWC): Net Working Capital refers to the difference between Current Assets and Current Liabilities which refers to the claims of outsiders which are expected to mature for payment within an accounting year and include creditors or accounts payables, bills payables and outstanding expenses (Muralikrishna B.2012). This can be mathematically presented as:

Working Capital=Current Assets-Current liabilities

Net Working Capital can be positive or negative. A positive net working capital will arise when current assets exceed current liabilities and a negative net working capital arises when current liabilities exceed current assets. Every business concern should have neither cause excess WC nor it should be short of WC. Both conditions are harmful and unprofitable for any business. But out of these two, the shortage of WC is more dangerous for the wellbeing of the firms. Net working capital indicates the liquidity position of and suggests the extent to which working Capital needs may be financed by permanent sources of funds.

Types of working capital (WC)

Most businesses experience seasonal or cyclical fluctuations. For example, construction firms have peaks in the spring and summer, retailer's peak around Christmas, and manufacturers who supply both construction companies and retailers follow similar patterns. Similarly, all businesses must build up current assets when the economy is strong, but they then sell off inventories and reduce receivables when the economy slacks off. (Brigham and Daves,2007). Hence, based on time, working capital may be classified into two important types as permanent and temporary working capital and briefly discussed below.

Permanent Working Capital: It is also known as Fixed Working Capital. It is the capital; the business concern must maintain certain amount of capital at minimum level at all times. (Paramasivan and Subramanian, 2009). In other words, it represents the current assets required on a continuing basis over the entire year. Further, working capital has a limited life and usually not exceeding a year, in actual practice some part of the investment in that is always permanent. Since firms have relatively longer life and production does not stop at the end of a particular accounting period some investment is always locked up in the form of raw materials, work-in progress, finished stocks, book debts and cash. Investment in these components of working capital is simply carried forward to the next year. This minimum level of investment in current assets that is required to continue the business without interruption is referred to as permanent working capital (Fabozzi and Peterson, 2003). It's financed through long term debt and common stock.

Temporary Working Capital: it's also known as the circulating or transitory working capital. This is the amount of investment required to take care of the fluctuations in the business activity. Fabozzi and Peterson (2003) they defined as a rises of working capital from seasonal fluctuations in a firm's business. Because firms do not have to maintain this form of working capital throughout in the year, or year after year, it may be better to use short-term (bank credit) rather than long-term sources of capital to satisfy temporary needs. In other words, it represents additional current assets required at different times during the operating year. For example, extra inventory has to be maintained to support sales during peak sales period (seasonal working capital). Similarly, receivable also increase and must be financed during period of high sales. On the other hand investment in inventories, receivables and the like will decrease in periods of depression (special working capital). Temporary working capital fluctuates over time with seasons and special needs of firm operations, whereas, permanent WC changes as firms sizes increases overtime. Further, temporary WC is financed by short term debt.

2.1.2 Management of working capital components

Inventory Management Inventory is a proper planning of purchasing of raw materials, handling, storing, recording and management of related items.(Paramasivan and Subramanian 2009). “Inventory may be classified as Supplies, Raw materials, Work in progress and finished goods.” Brigham and Houston (2002). These classes of inventory are essential part of virtually all business operations, as with the case of account receivables, inventory levels depends heavily on sales, whereas receivables build up after sales have been made, inventory must be acquired ahead of sales. The necessity of forecasting sales before establishing target inventory levels makes inventory management a difficult task. Also, since error in the establishment of inventory levels quickly leads to low sales or excessive carrying cost, inventory management is as important as it is difficult. They further said that, Proper inventory management requires close coordination among the sales, purchasing, production and the finance departments as a result the finance manager must arrange any financing needed to support the inventory build-up, because lack of coordination among the departments may lead to poor sales forecast, hence leading to disaster.

Moreover, Brigham and Houston (2002) gave the following as the twin goals of inventory management: “To ensure that inventory needed to sustain operations are available and to hold the cost of ordering, and carrying inventory to the lowest possible levels, they also stated that inventory is costly to store, therefore there is always pressure to reduce it as part of the firms cost –containment strategies”. “ There are cost associated with holding too little inventory because holding little inventory increases ordering cost and the firm can miss out on profitable sales hence suffer a loss of goodwill that can lead to lower future sales”. So it is important to have enough inventories on hand to meet customer demands, this then reduces the cost of goods sold and increases their net profit margin. Inventory policy has been seen as a key component of working capital.

Monitoring inventory management

Companies can monitor its inventory by looking through its financial ratios like that of monitoring receivables. Inventory turnover ratio in days (ITID) tells you, on average, how many times inventory flows through the firm—from raw materials to goods sold— during the period.(Fabozzi and Peterson, 2003). Hence, the ratio is calculated by dividing inventory by cost of goods sold and multiplying with 365 days and depicted as follows:

Inventory Conversion/Turnover in Day (INV.COV) = Inventory / (Cost of sales/365)

In general there is no rule of thumb or standard for interpreting the inventory turnover ratio. The norms may be different for different firms depending upon the nature of industry and business conditions. However the study of the comparative or trend analysis of inventory turnover is still useful for financial analysis.

Account receivables Account receivable occupy an important position in the structure of current assets of a firm. They are the outcome of rapid growth of credit sales granted by the firms to their customers. It is considered as a marketing tool acting as a bridge between production and sales to customers. Firms grant credit to protect its sales from the competitors and attract the potential customers. It is not possible to increase the sales without credit facility and increase in sales also increases profits. Both investments on account receivables involve certain costs and risks. Further there is a risk of bad debt also. Therefore a great deal of attention is normally paid to the effective and efficient management of account receivable.(B.Muralikrishna 2012)

Monitoring account receivable

Companies can monitor how well accounts receivable are managed using aging schedules and financial ratios. In aging analysis, a company's account receivables are classified into different categories based on number of days they are past due after sales such as 1 to 30 days, 31 to 40 days, 41 to 50 days and so on and it helps managers to get a more detailed picture of collection efforts. The schedule can represent the receivables according to how many there are in each age group or according to the total dollars the receivables represent in each age group. Hence, the higher the numbers of accounts or dollars in the shortest term groups, the faster the collection or efforts are made (Fabozzi and Peterson, 2003). Whereas, financial ratio can be used to get an overall picture of how fast credit manager collect accounts receivable.

Therefore, the average collection period (ACP) represents the average number of days for which a firm has to wait before its debtors are converted into cash. It is calculated by dividing accounts receivable by purchases and multiplying the result by 365 and written as:

$$\text{Average collection period (ACP)} = \text{Receivables} / (\text{Sales}/365)$$

This ratio measures the quality of debtors. A short collection period implies prompt payment by debtors. It reduces the chances of bad debts. Similarly, a longer collection period implies too liberal and inefficient credit collection performance. It is difficult to provide a standard collection period of debtors (Brigham and Houston, 2003).

Account payables Firms generally make purchases from other firms on credits, recording the debts as account payables. Account payable is the largest single category of operating current liabilities, representing about 40% of the current liabilities of the average non-financial corporation. The percentage is somewhat larger for small firms: because small companies often do not qualify for financing from other sources, they rely especially heavily on trade credit. (Brigham and Ehrhardt 2008)

Monitoring Account payables

One way of monitoring accounts payables is by the Average payment period (APP) or day's payables outstanding ratio which measures the average length of time between the purchase of materials or labor and the payment of cash for supplies (Brigham and Houston 2003). It can be calculated as:

$$\text{Average Payment period (APP)} = \text{Payables} / (\text{Cost of Goods Sold}/ 365)$$

In general, if a company has a small number of accounts payable days, it could mean that the company is paying the bills very early or is taking advantage of purchase discounts (requiring early payment). On the other hand, if a company has a large number of accounts payable days, it could mean that the company has low cash flows not sufficient to pay bills on time.

Cash management Business needs cash to make payments for acquisition of resources and services for the normal conduct of business. Cash is one of the important and key parts of the current assets. (Paramasivan and Subramanian 2009). Approximately 1.5% of the average industrial firm's assets are held in the form of cash. Cash itself earns no interest. The goal of cash management is to minimize the amount of cash the firm must hold for use in conducting its normal business activities at the same time to have sufficient cash to take trade discounts, to maintain its credit rating and to meet unexpected cash needs.(Brigham and Ehrhardt 2008).

Holding a cash reserve is justifiable for all the businesses but how much cash a company should have? It is a big and very important question because too little cash might push a company in a situation where it will not be able to pay its current liabilities. On the other hand having high cash balance will not produce any return. The minimum level of cash reserve depends on the ability of a company to raise cash when it is required, future cash needs and companies will to keep cash to safeguard future unexpected events. Companies also want to have enough cash reserve to exploit the investment opportunities available in the future but having a very high level of cash reserve can turn out to be an idle resource. The maximum level of cash reserve depends on investment opportunities available in the future, return on these investments and transaction cost of making the investments (Gallagher and Joseph, 2000).

The cash conversion cycle (CCC)

Cash conversion cycle expresses in days how long it takes a company to convert the materials it purchases into cash. It is a metric which looks at the amount of time needed to sell inventory, the amount of time needed to collect receivables and the length of time the company is afforded to pay its bills without incurring penalties. The length of cash conversion cycle dictates the amount of money that needs to be tied up in working capital proportionate. (Muralikrishna B,2012). The cash conversion cycle can be shortened by reducing the inventory conversion period, by processing and selling goods more quickly, by reducing the receivables collection period by speeding up collections or by lengthening the payables deferral period by slowing down the firm's own payments. (Brigham and Houston 2003). Cash conversion cycle is also used as a gauge to measure the aggressiveness of working capital policy. It is believed that longer cash conversion cycle corresponds to defensive working capital policy and shorter cash conversion cycle corresponds to aggressive working capital policy (Arnold, 2008).

In order to calculate the CCC one has to first calculate average collection period, inventory turnover in day and average payment period (as discussed previously in this section). In deed the formula used to compute cash conversion cycle is represented as follows:

$$\text{CCC} = \text{Average collection period} + \text{Inventory Turnover in day} - \text{Average Payment Period}$$

In general, depend up on the company policy lowering CCC without increasing cost and reducing sales may be preferable for the firm to have a good position of liquidity.

2.1.3 Factors Affecting Working Capital Requirements

The working capital requirement of a concern depends upon a large numbers of factors such as nature and size of business, the character of their operations, the length of production cycles, and the state of economic situation. It is not possible to rank them because all such factors of different importance and the influence of individual factors changes for a firm overtime. (B.Muralikrishna,2012).However the following are important factors generally influencing the working capital requirement:

- 1. Nature or Character of Business:** The working capital requirement of a firm basically depends upon the nature of this business. Public utility undertakings like electricity water supply and railways need very limited working capital because they offer cash sales only and supply services, not products and as such no funds are tied up in inventories and receivables. Generally speaking it may be said that public utility undertakings require small amount of working capital, trading and financial firms require relatively very large amount, whereas manufacturing undertakings require sizable working capital between these two extremes.
- 2. Size of Business/Scale of Operations:** The working capital requirement of a concern is directly influenced by the size of its business which may be measured in terms of scale of operations.
- 3. Production Policy:** In certain industries the demand is subject to wide fluctuations due to seasonal variations. The requirements of working capital in such cases depend upon the production policy
- 4. Manufacturing Process/Length of Production Cycle:** In manufacturing business the requirement of working capital increases in direct proportion of length of manufacturing

process. Longer the process period of manufacture, larger is the amount of working capital required.

5. **Seasonal Variation:** In certain industries raw material is not available through out the year. They have to buy raw materials in bulk during the season to ensure and uninterrupted flow and process them during the entire year.
6. **Credit Policy:** The credit policy of a concern in its dealing with debtors and creditors influence considerably the requirement of working capital. A concern that purchases its requirement on credit and sell its products/services on cash require lesser amount of working capital.
7. **Business Cycle:** Business cycle refers to alternate expansion and contraction in general business activity. In a period of boom i.e., when the business is prosperous, there is a need of larger amount of working capital due to increase in sales, rise in prices, optimistic expansion of business contracts sales decline, difficulties are faced in collection from debtors and firms may have a large amount of working capital lying idle.
8. **Rate of Growth of Business:** The working capital requirement of a concern increase with the growth and expansion of its business activities. Although it is difficulties to determine the relationship between the growth in the volume of business and the growth in the working capital of a business, yet it may be concluded that of normal rate of expansion in the volume of business, we may have retained profits to provide for more working capital but in fast growth in concern, we shall require larger amount of working capital
9. **Price Level Changes:** Changes in the price level also effect the working capital requirement. Generally the rising prices will require the firm to maintain larger amount of working capital as more funds will be required to maintain the same current assets.

2.1.4 Working Capital Policy

Working capital policy can be best described as a strategy which provides the guideline to manage the current assets and current liabilities in such a way that it reduces the risk of default (Afza & Nazir, 2007). Working capital policy is mainly focusing on the liquidity of current assets to meet current liabilities. Liquidity is very important because, if the level of liquidity is too high then a company has lot of idle resources and it has to bear the cost of these idle resources. However, if liquidity is too low then it will face lack of resources to meet its current financial liabilities (Arnold, 2008). Working capital policy classified into three categories as defensive or hedging, aggressive and conservative working capital policy (Arnold, 2008) and discussed as follows:

Conservative Working Capital Policy:- conservative policy refers to minimize risk by maintaining a higher level of working capital. This type of policy is suitable to meet the seasonal fluctuation of the manufacturing operation.(Paramasivan and Subramanian 2009). It is also a mixture of defensive WCP and aggressive WCP. Under this approach, the firm carries high investment in current assets such as cash, marketable securities and carries large amount of inventories and grant generous terms of credit to customers resulting in high level of debtors. (Muralikrishna B., 2012). In these approach temporary current assets, assets which appear on the balance sheet for short period will be financed by the short term borrowings and long term debts are used to finance fixed assets and permanent current assets (Weston and Brigham, 1977). Thus, the follower of this approach finds the moderate level of working capital with moderate risk and return. It is called as “low profit low risk” concept (Paramasivan and Subramanian 2009).

Defensive Working Capital Policy: - Company follows defensive policy by using long term debt and equity to finance its fixed assets and major portion of current assets. Under this approach, the business concern can adopt a financial plan which matches the expected life of assets with the expected life of the sources of funds raised to finance assets (Paramasivan and Subramanian 2009). Defensive policy reduces the risk by reducing the current liabilities but it also affects profitability because long term debt offers high interest rate which will increase the cost of financing (Arnold, 2008). This means a company is not willing to take risk and feel it appropriate to keep cash or near cash balances, higher inventories and generous credit terms.

Mostly companies that are operating in an uncertain environment prefer to adopt such a policy because they are not sure about the future prices, demand and short term interest rate. In such situation it is better to have a high level of current assets. Which means, keeping higher level of inventory in the stock, to meet sudden rise in demand and to avoid the risk of stoppage in production. This approach gives a longer cash conversion cycle for the company. It also provides the shield against the financial distress created by the lack of funds to meet the short term liability but as the researcher discussed earlier long term debt have high interest rate which will increase the cost of financing. Similarly, funds tied up in a business because of generous credit policy of company and it also have opportunity costs. Hence, this policy might reduce the profitability and the cost of following this policy might exceed the benefits of the policy.

Aggressive Working Capital Policy:-aggressive working capital is one of the high risky and profitability policies which maintains low level of working capital against the high level of sales, in the business concern during a particular period .(Paramasivan and Subramanian 2009). Under this policy investment in current assets is very low. The firm keeps less amount of cash and marketable securities, manage with less inventories and tight credit terms resulting in low level of debtors. The consequence of this policy are frequent production stoppages, delayed deliveries to customers and loss of sales. (Muralikrishna B, 2012). Therefore, such a policy is adopted by the company which is operating in a stable economy and is quite certain about future cash flows. A company with aggressive working capital policy offers short credit period to customers, holds minimal inventory and has a small amount of cash in hand. This policy increases the risk of default because a company might face a lack of resources to meet the short term liabilities but it also gives a high return as the high return is associated with high risk (Arnold, 2008).

Company with stable sale or growing sale can adopt the aggressive policy because it has a confidence on its future cash inflows and is confident to pay its short term liabilities at maturity. On the other hand a company with unstable sale or with fluctuation in the sale can't think of adopting the aggressive policy because it is not sure about its future cash inflows. In such a situation adoption of aggressive policy is similar to committing a suicide. Hence, searching other method might be the best choice.

2.2 Theoretical linkages between working capital management and the profitability of a firm

The management of Working capital is important to the financial health of business of all sizes. Working capital meets the short term financial requirements of a business enterprise. It is a trading capital not retained in the business in a particular form for longer than a year. The money invested in it changes form and substance during the normal course of business operations. The need for maintaining an adequate Working capital can hardly be questioned. Just as the circulation of blood is very important in the human body to maintain life, the flow of funds is very necessary to maintain business. Working capital starvation is generally credited as the major cause if not a major cause of small business failure in many developed and developing countries (Rafuse, 1996). The success of a firm depends ultimately, on its ability to generate cash receipts in excess of disbursement. Given these peculiarities efficient management of working capital and more recently good credit management practice is pivotal to the health and performance of the small firm sector. (Peel and Wilson, 1996).

2.2.1 Profitability measures

Profitability is a measure of net earnings, relative to components used to generate earnings. It is also a measure of efficiency, providing evidence for how well a company utilizes things like assets or equity in order to generate both revenue and profit. Profitability ratios are important for defining the quality of a company's earning stream and shed light on a company's ability to generate cash.(Gillingham,2015). High percentage of profitability plays a vital role to bring external finance in the business because creditors, investors and suppliers do not hesitate to invest their money in such a company (Fabozzi and Peterson 2003). There are several measures of profitability which a company can use. Few measures of profitability are discussed here:

Net profit margin (NPM): It calculates the percentage of each sale dollar remains after deducting interest, dividend, taxes, expenses and costs. In other words it calculates the percentage of profit a company is earning against its per dollars sale. Higher value of return on sale shows the better performance (Gitman, 1999).

NPM = (Earnings available for common stakeholder / Net sales)*100

Return on asset (ROA): This ratio explains that how efficient a company is to utilize its available assets to generate profit. It calculates the percentage of profit a company is earning against per dollar of assets (Weston and Brigham (1977)). The higher value of ROA shows the better performance and it can be computed as follows:

ROA = (Earnings Available For Common Stockholders / Total Asset)*100

Gross operation profit (GOP): this ratio explains that how efficient a company is to utilize its operating assets. This ratio calculates the percentage of profit earned against the operating assets of the company (Weston and Brigham, 1977).

Gross operating profit = (Sales – COGS) / (Total asset –financial asset)

Net operation profit (NOP): refers to the amount of money that a company has earned after the cost of goods sold and operating expenses have been deducted. This is used to see whether a company is making more than it spends or is operating at a loss. Net profit also is referred to as "the bottom line," because it is usually shown at the bottom of an income statement. This measurement of profit is important because it measures a company's profitability and how well its management is growing that profitability. Profitability simply refers to the company's ability to earn a profit. Expenses outside the company's own operations, such as investments in other firms and start-up costs, are not included in the equation for calculating net profit. This is so that it can serve as a true measure of a company's long-term profitability without deducting one-time expenses.

There are several reasons for examining the net operating profit of a company. Businessmen who wish to invest in the company will learn about the management's skill in growing its profitability simply by looking at the bottom line. If the company's revenues exceed its operating and goods expenses, this speaks well for the future and longevity of the company.

2.3 Review of Empirical studies

The previous section presented the theories of working capital management focusing on components, determinant of working capital requirement, and bases which help us to manage the working capital. This section reviews the empirical studies on the impact of working capital management on profitability in different types of firms

Deloof (2003) investigates the relation between WCM and corporate profitability for a sample of 1,009 large Belgian nonfinancial firms for the 1992-1996 periods. It can be expected that the way in which working capital is managed will have a significant impact on the profitability of firms. A popular measure of WCM is the cash conversion cycle, i.e. the time lag between the expenditure for the purchases of raw materials and the collection of sales of finished goods. Number of days accounts receivable, inventories and accounts payable are used as measures of trade credit and inventory policies. The cash conversion cycle is used as a comprehensive measure of WCM. The cash conversion cycle was not used in the study because not all information necessary for calculation is available. Profitability is measured by gross operating income. In his paper, he finds a significant negative relation between gross operating income and the number of days accounts receivable, inventories, and accounts payable of Belgian firms. These results suggest that managers can create value for their shareholders by reducing the number of days accounts receivable and inventories to a reasonable minimum. The negative relation between accounts payable and profitability is consistent with the view that less profitable firms wait longer to pay their bills.

Padachi (2006) conducted a study on small Mauritian manufacturing firms, during 1998 to 2003, and found that by lengthening the number of days for accounts payable the profitability can be impaired because of the implicit cost of discount for early payment to suppliers. When sales are low, firms postpone the payment to creditors in order to survive. Using return on total assets as measure for profitability, he found that the number of days in accounts receivable has a negative significant relation with return on total assets which implies that an increase of accounts receivable with one day will result in a lower profitability. Furthermore, Padachi did not find any significant coefficient between inventories and the profitability.

Lazaridis and Tryfonidis (2006), investigate the relationship between working capital management and firms' profitability for 131 listed companies in the Athens Stock Exchange for the period 2001-2004. Since working capital management is best described by the cash conversion cycle the researchers try to establish a link between profitability and management of the cash conversion cycle. To understand the way working capital is managed cash conversion cycle and its components were statistically analyzed. The researchers observed a negative relationship between profitability (measured through gross operating profit) and the cash conversion cycle which was used as a measure of working capital management efficacy. The researchers found that lower gross operating profit is associated with an increase in the number of days of accounts payables. The above could lead to the conclusion that less profitable firms wait longer to pay their bills taking advantage of the credit period granted by their suppliers. The negative relationship between accounts receivables and firms' profitability suggests that less profitable firms will pursue a decrease of their accounts receivables in an attempt to reduce their cash gap in the cash conversion cycle. Likewise, the negative relationship between the number of days in inventory and corporate profitability suggests that in the case of a sudden drop in sales accompanied by mismanagement of inventory will lead to tying up excess capital at the expense of profitable operations.

Raheman and Nasr (2007) studied the effect of different variables of working capital management including average collection period, inventory turnover in days, average payment period, cash conversion cycle, and current ratio on the net operating profitability of Pakistani firms. They selected a sample of 94 Pakistani firms listed on Karachi Stock Exchange for a period of six years from 1999 - 2004 and found a strong negative relationship between variables of working capital management and profitability of the firm. They found that as the cash conversion cycle increases, it leads 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. By managing the working capital efficiently, the firm's success can be regarded as ensured whereas an inefficient management of working capital can lead to complete fiasco for the firm.

García-Teruel and Pedro Martínez-Solano(2007) studies about the effects of working capital management on the profitability of a sample of small and medium-sized Spanish firms, they collected a panel of 8,872 SMEs covering the period 1996-2002. Return on assets (ROA) is used to measure profitability. They find a significant negative relation between an SME's profitability and the number of days accounts receivable and days of inventory. They cannot, however, find the number of days accounts payable affects an SME's return on assets, relation loses significance.

Gill A, Biger N, and Mathur N(2010) investigate the relationship between working capital management and the firms' profitability for a sample of 88 American manufacturing companies listed on the New York Stock Exchange for a period of 3 years from 2005-2007. The researchers observed i) a negative relationship between profitability (measured through gross operating profit) and average days of accounts receivable and ii) a positive relationship between cash conversion cycle and profitability. Regarding the average days of accounts payable and the profitability of the firm, they found no statistically significant relationship between these variables. Examining the relationship between the average number of days the inventory is held and the profitability they found no significant relationship in their sample.

Charitou M.S ,Elfani M and Lois P(2010) the study investigate the effect of working capital management on the firm's financial performance in an emerging market. The data set consists of industrial firms listed on Cyprus stock exchange for 10 years period 1998-2007. In total 43 firms were included in the sample. Profitability was measured as return on asset (ROA).A key factor in the working capital management is cash conversion cycle (Deloof 2003) the cash conversion cycle is the measure of working capital management. Using multivariate regression analysis the result confirm that the components of the cash conversion cycle namely, days in inventory, day sale outstanding and creditors payment period, if managed efficiently, add value to the firm since they increase firms profitability. Efficient utilization of firms resources lead to increased profitability and reduces volatility which leads to the reduction in default risk and thus improves the firm's value.

Sharma and Kumar (2011) measured the relationship between profitability and cash conversion cycle for firms in India. 263 non-financial firms in the Bombay Stock Exchange(BSE) 500 have been analyzed between 2000 and 2008. With control variables sales growth, leverage, current ratio, and firm size the profitability is measured with the return on assets. They found a negative relationship between profitability and the number of days in inventory, which indicates that the less time it takes for inventory the more profit can be made because more turnovers can be established. The relationship between the cash conversion cycle and profitability is positive agreeing with Gill (2010). The study finds a negative relationship between profitability and the number of days accounts payables, but a positive relationship between profitability and the number of days accounts receivables. The WCM and profitability show a positive relationship.

Haq ul Ikram ,Sohail M , Zaman k and Alam Z(2011) the study has been made to analyze the empirical study of cement industry of Pakistan for examining the effect of working capital on profitability during the period of 2004 to 2009. The study covers a sample of 14 cement firms of Pakistan. Profitability was measured by return on investment. The data was analyzed using the techniques of correlation coefficient and multiple regression analysis. The result concluded that there is a moderate relationship between working capital management and firm's profitability.

Leon S.A.J (2013) the study focuses on identifying working capital management impact on profitability in listed companies in srilanka. The relationship between working capital management practices and its effects on profitability of selected five sectors listed on Colombo stock exchange for a period of five years from 2003-2007 was used. The research found that working capital has significant impact on profitability of the sector.

Akoto R.K ,Awungo-Vitor D and Angmor P.L (2013) The study examine how working capital management practices of 13 manufacturing firms in Ghana impact their profitability for period covering from 2005 to 2009. Return on equity is used to measure profitability. The study finds that account receivable days significantly negatively influence profitability of listed manufacturing firms in Ghana. Positive and insignificant relationship between account payable days and profitability. Cash conversion cycle significantly positively affects profitability. Sales significantly and positively affect profitability. The study suggests that managers can create value for their stake holders by creating incentives to reduce their account receivable to 30 days.

Luchinga L.M (2014) the study examine the effect of working capital management and financial performance of agricultural firms listed in Nairobi securities exchange. The population for the study constituted all agricultural companies quoted at NSE which are seven in number for the period of four years from 2009 to 2012. Data have been analysed by applying both descriptive and inferential statics. The study found that inventory turnover in days has negative relationship with return on equity. Average payment period is found to be significantly positively associated with return on equities. Cash conversion cycle and net payment period shows significant negative relation with return on equities. Liquidity (current ratio) is positively associated with return on equities.

Enow S.T and Brijlal P (2014) Working capital management may differ between small and large businesses. Small businesses have fewer alternative sources of external finance available, which make them more dependent on short-term finance in general and on trade credit in particular. The study investigates the effect of working capital management on the profitability of SMMES. Over a period of five years from 2008 to 2012 using 15 south African SMMES. Profitability was measured by return on assets (ROA). Using a multiple regression analysis the result shows a positive relationship between number of days account receivable, number of days inventory and negative relationship between number of days payables and cash conversion cycle. Thus minimizing working capital and decreasing the cash conversion cycle increases profitability and hence stakeholder value.

Al-Mawsheki (2014) the study investigate the effect of working capital management on profitability of construction firms in Malaysia for a period of 2001-2012 Using a balanced panel data of thirty construction firms that are on the list of kuala lumpur stock exchange. By using descriptive stastics,correlation and regression analysis, the result of the study show that cash conversion cycle, receivable collection period, payable collection period are significantly negative having an effect on firms profitability. Inventory collection period has a negative insignificant effect on the profitability. There is a significant impact for the financial leverage, sales growth and firm size on the profitability of firms. The study comes to conclusion that construction firms profitability can be increased by efficient management and financing of working capital.

Hoang T.V(2015) The efficiency of working capital management is particularly vital for manufacturing firms where a major part of asset is composed of current asset. The study investigates impact of working capital management on profitability of 98 manufacturing firms listed on Ho chi minh stock exchange over a period of 2009 to 2014. Profitability of firm was measured by Return on assets. The results of Pearson's correlation and fixed effects multiple regression analysis demonstrate that working capital management plays a positive role in increasing the wealth of stakeholders by making a firm more profitable through shortening cash conversion cycle. average collection period, average inventory period and average payment period are found to have a significant negative effect on Return on asset.

Garg A.K and Gumbochuma I (2015) efficient working capital management is an integral component of the overall corporate strategy to create stake holders wealth. The study seeks to explain the relationship between working capital management and profitability for the Johannesburg stock exchange (JSE) listed companies in general retail sector. The study covered a period of 10 years from 2004 to 2013. Firm data from 17 companies in general retail sector listed on the JSE were used. Profitability was measured by operating profit margin. Using panel data the study found negative relationship between working capital and profitability. Firms profitability and financial debt ratio was also negative. Larger firm size was found to produce a positive and significant effect on profitability. The result demonstrates that working capital management affect profitability and should be integral part of a firms financial planning.

Mifta Ahmed(2016) the study examines the impact of working capital management on profitability of manufacturing share companies in Ethiopia. A sample of 16 manufacturing share companies is used for a period of seven years (2008-2014). Data was analysed on quantitative basis using descriptive and regression analysis method. The key finding from the study are, there exists a significant negative relationship between average collection period and profitability, there exists insignificant negative relationship between inventory holding period with profitability and positive relationship between account payable period and profitability, there exists a negative relationship between cash conversion cycle and profitability of the firm, A positive relationship between liquidity and profitability. The study recommended that firms should minimize working capital management components in order to maximize profitability.

Toan L.D, Nhan H.V, Anh L.N.N and Man L.Q (2017) the study explains the relationship between working capital management and profitability with Vietnam empirical evidence. A sample of 34 construction companies listed in Vietnam stock exchange for the period of 2007-2015 was used. Profitability measured by Gross operating profit. Using descriptive statics, correlation and regression analysis. The study found that statistically significant negative relationship between cash conversion cycle with profitability, statistically significant positive relationship between debt ratio and fixed financial asset ratio with construction companies profitability. Negative relationship between account receivable and gross operating profit, significant negative relationship between account inventory period and profitability. Sales growth affect positively to companies profitability, the study recommend that managers can enhance company's profitability if they administrate their working capital in an optimal way.

Oluwatoyin O.R(2017) Lack of proper control of working capital can destroy the smooth running of the firm. It therefore infers that the management must be capable to strike a balance between the ideal current assets and current liabilities that maximizes the overall profit of the firm. The study examines the effect of working capital management on profitability of banks in Nigeria. It uses first bank PLC and covers data from 1981 to 2015. The study finds that accessibility to long term funds will boost efficient working capital management and also enhance bank profitability. It is therefore important that management communicates the importance of working capital management to all stakeholders so that they can all pursue the efficient utilization within the company.

Mbakara P.W (2017) the study examined the effects of working capital management on the profitability of construction firms in nairobi stock exchange for the period 2010-2014. Only five firms comprised the population. Profitability measured as return on assets. Descriptive, correlational and regression analysis was used. The results obtained indicated that only cash management practices had a significant effect on profitability. The other independent variables:- inventory, account receivable, account payables had a positive relationship with return on asset but their relationship was not significant. It can therefore be expected that the way in which working capital is managed will have a significant impact on profitability of those firms.

Ephrem Assefa's (2018) study evaluates the impact of working capital management and firm's performance in the case of grade one construction companies in Ethiopia. The study used four measures of working capital to test whether working capital management has a statistically significant effect on profitability from the year 2011 to 2016. The researcher analyzed 45 grade one construction companies in Addis Abeba. The researcher finds that 1) Inventory Conversion Period has a positive relation with gross operating profits of the assessed firms and statistically significant. 2) Payable Outstanding has a positive relationship with the Gross Operating Profit and it is also significant. 3) Cash Conversion Cycle is statistically significant and has negative coefficient relation with the Gross Operating Profit. 4) Sales Outstanding is a negative relation with the GOP, but it is insignificant.

Beemnet Kumelachew (2018) the study examine the impact of working capital management on profitability of construction firms in Ethiopia the case of category A construction companies. A sample of 17 construction companies is used for a period of eight years (2008-2015). Data was analyzed on quantitative basis using descriptive and regression analysis method. Profitability measured as Return on assets. The key findings of the study are, there exists a significant negative relationship between average collection period and profitability, a negative relationship between inventory holding period with profitability and positive relationship between account payable period and profitability. But both inventory holding period and account payable period was found to be insignificant in affecting profitability of the firms. There exists a negative relationship between cash conversion cycle and profitability of the firms. The study recommended that firms should minimize working capital management components in order to maximize profitability.

Anton S.G, Elena A and Nucu A (2021) The study seeks to examine the profit creating potential of working capital for a sample of 719 polish listed firms over the period of 2007-2016. the study uses different panel data techniques (ordinary least squares, fixed effects and panel-corrected standard errors models). The result showed that working capital has a positive effect on the profitability of polish firms to breakeven point. After breakeven point working capital starts to negatively affect firm profitability.

Table 1 Summarizes some of the findings of various researchers on the relationship between working capital management components and firms profitability:

	Profitability Measure	Relation AR and Profitability	Relation Inv and Profitability	Relation AP and Profitability	Relation CCC and Profitability
Deloof (2003)	Gross Operating Income	Negative	Negative	Negative	Negative
Lazaridis and Tryfonidis (2006)	Gross Operating Profit	Negative	Negative	Negative	Negative
Raheman and Naser(2007)		Negative	Negative	Negative	Negative
Garcia-Teruel and Martinez-Solano(2007)	Return on Asset	Negative	Negative	No significant Relationship	Negative
Gill et al (2010)	Gross Operating Profit	Negative	No significant relationship	No significant relationship	Positive
Sharma and Kumar (2011)	Return on Assets	Positive	Negative	Negative	Positive (not significant)
Akoto and Angmor(2013)	Return on Equity	Negative	Positive	No significant	Positive
Enow and Brijlal(2014)	Return on Asset	Positive	Positive	Negative	Negative
Al-Mawsheki(2014)		Negative	No significant relationship	Negative	Negative
Mifta Ahmed(2016)		Negative	No significant relationship	Positive	Negative
Ephrem Assefa(2018)	Gross Operating Profit		Positive	Positive	Negative
Beemnet Kumelachew(2018)	Return on Asset	Negative	No significant relationship	No significant relationship	Negative

Where AR = number of days of Accounts Receivables; Inv = number of days of Inventory; AP = the number of days of Accounts Payables; CCC = number of days of Cash Conversion Cycle.

Relationship between number of days Accounts receivable and profitability: Most of the findings indicate that there is a negative relationship between the number of days Accounts receivable and profitability. This implies that a longer time span for retrieving payments from customers is associated with low profits. Lazaridis and Tryfonids (2006) for instance, rationalize their finding by stating that less profitable firms decrease the accounts receivables in order to reduce the cash gap in the cash conversion cycle. But still there exist some inconclusiveness about the findings. Sharma and Kumar (2011) who conducted their research in India found a positive relationship which implies that firms can improve the profitability by lengthening the credit period for their customers. The rationale these researchers came up with was that Indian companies grant longer credit periods in order to sustain their market and respond to competition.

Relationship between number of days Accounts payable and profitability: In contrast to other researchers, Mifta Ahmed(2016) and Ephrem Assefa(2018) find a positive relationship between the number of days Accounts payable and profitability. Mifta Ahmed(2016) contemplated that the longer the firms account payable period the higher the profitability which is described as the longer a firm delays its payments to its creditors, can increases profitability. Ephrem Assefa(2018) explained the positive relationship by the increased availability of funds caused by the delayed payment of account payment, such as funds can thus be used for productive purposes that can increases profitability. Sharma and Kumar (2011) revealed a negative relationship between the accounts payable and profitability and stated that the number of days to pay bills to suppliers depends on the profitability of the firm. Less profitable firms tend to wait longer to pay their bills. This is also confirmed by Deloof (2003).

Relationship between number of days Cash Conversion Cycle and profitability: Over the years, researchers found a negative relationship between number of days Cash Conversion Cycle and profitability, but some researchers such as Sharma and Kumar (2011) and Amarjit Gill (2010) have found in contrary a positive relationship. Their result implies that firms with shorter cash conversion cycle will generate lesser profits and vice versa.

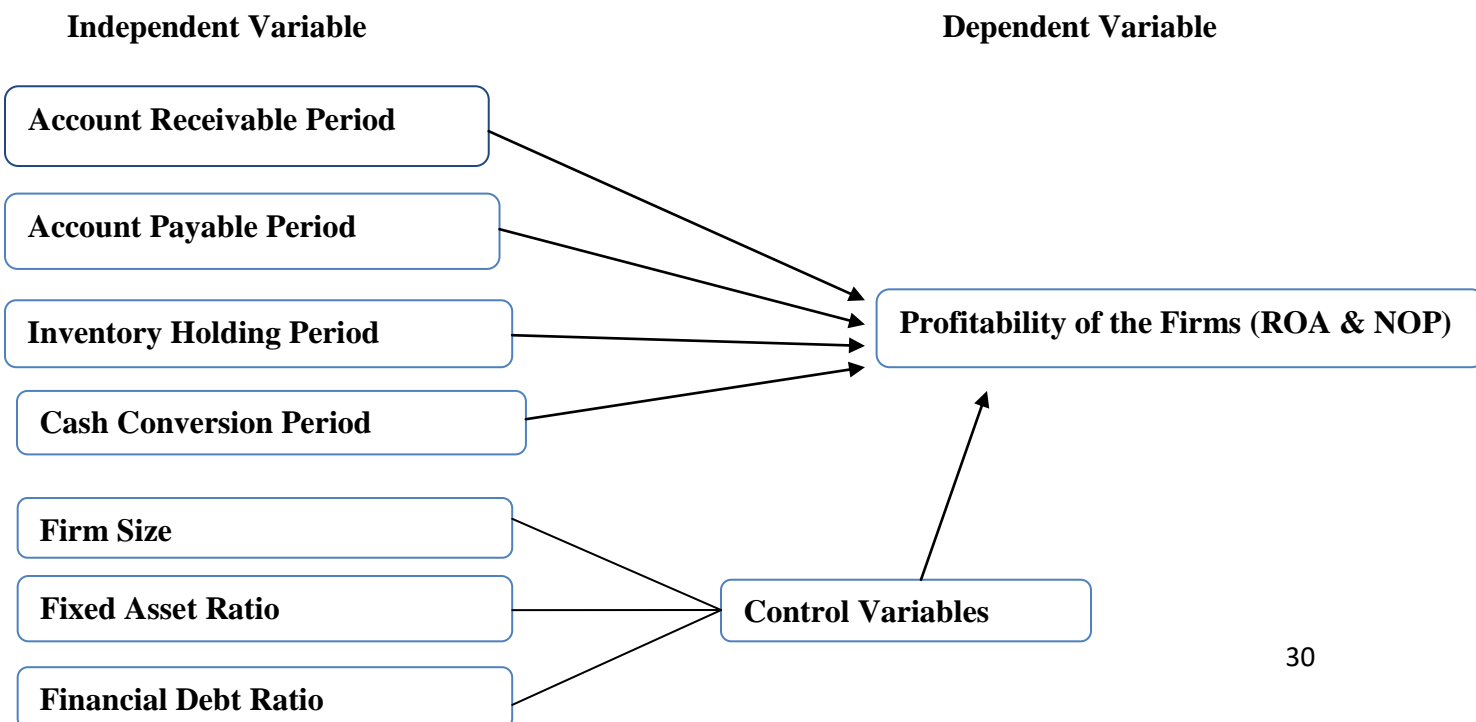
But Sharma and Kumar (2011) also state that this positive relationship is not significant. However, Gill et al (2010) found a significant positive relationship between the CCC and the profitability.

2.4 Knowledge gap

Domestic contractors in Ethiopian construction industry are experiencing severe liquidity problems and due to this situation they cannot undertake even medium construction projects. (Ministry of work and urban development,2021. To change this situation there is a crucial need of working capital management. This problem makes the student researcher conduct this study. And, in case of Ethiopia there are literatures such as ,Henok Yohannes (2015), Miftah Ahmed (2016) and Mulualem Mekonen (2011) focused on the impact of working capital management on profitability of Manufacturing share companies and small and medium enterprise (SMEs) by considering different variables . But in Ethiopia to the knowledge of the researcher, empirical studies on the area of working capital management and its impact on the profitability of Construction Company are few. This study therefore, aimed to contribute to this research gap and identify which variables of working capital have a significant role on the profitability of construction companies that are located in Addis Ababa, Ethiopia.

2.5 Conceptual Framework of the study

The following figure presents the conceptual framework of the relationship between working capital management measures and profitability of firms.



Chapter Three

Research Design and Methodology

3.1 Research design

The study adopts descriptive and explanatory research design. In planning a research project, researchers need to identify whether they will employ a qualitative, quantitative or mixed methods design. Decisions about choice of a design are influenced by assumptions about the research, specific strategies of inquiry, research methods, research problem, the personal experiences of the researcher and the audience for whom the researcher writes. (W.Creswell,2009). This study has assessed the relationship of working capital management and the profitability of selected local class one construction firms in Addis Ababa. To achieve the research objective and to test the hypotheses, the study adopted quantitative research approach. More specifically the study has implemented survey of document analysis of firms' audited financial statements as a data source.

The adoption of the survey analysis, in the study has the following benefits; first, generalization process from sample to population is the intention of a quantitative as opposed to a qualitative researcher. In this type of study, only sample subjects were studied and based upon characteristics of that sample, generalization was made back to the population where the sample is formerly chosen. Second, it allows the collection of large amount of data from a sizeable population in a highly economical way and thirdly survey method gathers data from a relatively large number of cases at a particular time. (C.R.Kothari,2004). Accordingly, the data for the study was collected using reviews of firms' financial statement (especially balance sheet and income statement). Further, the study was cross sectional study, in which it studies a particular phenomenon at particular time.

3.2 Sample Design

Sampling is the act, process, or technique of selecting a suitable section, or a representative part of a population for the purpose of determining parameters or characteristics of the whole population. (Lagares and Puerto, 2001). The target populations of the research are local class one construction companies in Addis Ababa. According to the information obtained from construction industry development and regulatory bureau in 2010 E.C total of 110 class one construction firms has been registered in Addis Ababa. Because of time, material, and the effort which will required to analyze every aspect of working capital management of each company it is impossible to include the total population in the research. The researcher does determine the sample size, and the sample size has been too high to administer which will result in high cost and takes long time to finish the study. Hence, through considering its limited time and resource the researcher has decided to use samples which make 15% of the total population which is 17. Beside; Simple random sampling method is used because the method is too easy to use , to give equal chance for all population and to minimizes the existence of sampling biases.

3.3 Data Collection Methods

Since the required data for the study is more quantitative, appropriate data couldn't be collected using simply distributed questionnaires to the company's managers or other concerned bodies. For the reason that the ultimate data for the study will depend mainly on secondary data. To gather data on working capital components, it is apparent to use a survey of structured document review. The researcher review the financial statements of each sample construction company (especially balance sheet and income statement). It is from these financial statements that variables such as net operation profit (NOP), Return On Asset(ROA), Account payables days (AP days) and Cash Conversion Cycle (CCC), and Liquidity information is generated. And the data which is collected from these financial statements consists of data of sales, payables, inventory, receivables, and costs of goods sold, etc. This data are used to calculate the inventory collection period, the receivable collection period, the payables deferral period, and the cash conversion period. These helps us to assess the level and effectiveness of companies at implementing those components.

3.4 The Explanatory of variables

In this section, the dependent, independent, and control variables are pointed out which will be used in the analysis. Furthermore, the reasons for the choice of these variables are explained. The independent variable represents the value that is manipulated whereas the dependent variable represents the result of the independent variables which are manipulated. The control variables represent the variables that influence these values.

The dependent variable

To analyse the effects of working capital management on the firm's profitability, the researcher use both the net operating profit and Return on Asset as the dependent variable.

Net Operating Profit = Operating Revenue – Operating Expenses

Return on Asset = Net Profit/Total Asset

The independent variables

The Cash Conversion Cycle (CCC), the Account payable (AP), and Account receivables (AR) are used to measure the profitability. The reason to choose the CCC is that according to Garcia-Tereul and Martinez- Solano (2007), the decision of how much to invest in customer and inventory accounts, and how much credit to accept from suppliers is reflected in the CCC. This measure is determined by the following equation

The components of the Cash Conversion Cycle are measured as follows:

Number of Days Accounts Receivables = Accounts Receivables/Sales*365

Number of Days Inventory = Inventory/Cost of Goods Sold*365

Number of Days Accounts Payables = Accounts Payables/Cost of Goods Sold*365

Cash Conversion Cycle = Number of Days Accounts Receivables + Number of Days Inventory– Number of Days Accounts Payable

Melicher and Leach (2009) define the Cash Conversion Cycle as the amount of time taken to buy materials and produce a finished good (the inventory-to-sale conversion period) plus the time needed to collect sales made on credit (sales-to-cash conversion period) minus the time taken to pay suppliers to pay for purchases on credit (the purchase-to-payment conversion period). The average collection period or accounts receivables period indicates how long it takes for a company to collect its money from its customers.

The inventory collection period (or inventory conversion period) indicates the time of a product between entering the firm as raw materials, and the moment of selling the product. These variables will be taken from the financial statements of the different listed firms and calculated as averages over the year.

The control variables

Other variables besides the independent and the dependent variables that may influence the profitability of a firm are the control variables: the firm size, the financial debt ratio, and fixed financial Asset ratio.

Firm Size

The size of the firm is regarded as a control variable because large companies have bargaining strength to obtain more favorable, extended credit terms from suppliers. By contrast, smaller companies may be required to pay their suppliers immediately. Another way that the size of a firm can make a difference is that bigger companies can purchase larger quantities of products. The firm size will be determined by the natural logarithm of sales. Researchers who have used this variable as a control variable are Deloof, 2003; Padachi, 2006; Lazaridis and Tryfonidis (2006); Dong and Su (2010).

Fixed Asset ratio

This variable is also of importance to determine the relationship between working capital and the profitability of a firm when financial assets have a part in the company's assets. According to Deloof (2003), fixed assets are mainly shares in affiliated firms, intended to contribute to the activities of the firm that holds them, by establishing a lasting and specific relation and loans that were granted with the same purpose. This control variable is calculated as follows: $\text{Fixed Assets} / \text{Total Assets}$. Other researchers who have used this control variable: Lazaridis and Tryfonidis (2006); Mathuva, 2009. The Fixed Financial Asset Ratio is included as a control variable because this variable affects the profitability of a firm.

Financial Debt Ratio

Financial Debt Ratio (leverage) shows how much of the firm's assets are financed by external debt. In case the finance charges due to external financing are larger than the earnings before interest and taxes, the firm can incur great losses. The Financial Debt Ratio will be calculated as follows: $(\text{Total liabilities (debt)}) / \text{Total Assets}$. Studies in which this control variable is used are Deloof, 2003; Lazaridis and Tryfonidis (2006); Dong and Su (2010). This variable is used because companies take debt from financial institutions and eventually firms have to pay the debt with interests back to them.

3.5 Data Analysis Techniques

This research is quantitative, and it involves some quantitative analyses with the use of statistical tools (descriptive and inferential). There are several software packages for the analysis of quantitative data some of which are broader in scope and user-friendly like the SPSS. After collecting relevant information, the researcher processed the raw data using SPSS V19.0 software packages. The study uses descriptive statistics, Pearson correlation coefficient, and regression analysis.

1. **Descriptive statistics:** The descriptive analysis is used to describe patterns of behavior or relevant aspects of phenomena and detailed information about each variable. Thus, it shows the average, and standard deviation of the different variables of interest in the study. Moreover, it also presents the minimum and maximum values of the variables which helps in getting a picture about the maximum and minimum values a variable can achieve and will be processed using SPSS.
2. **Correlation analysis:** The correlation analysis describes the relationship between variables which will be generated using the SPSS package. In this investigation of the relationship between working capital management and the profitability of a firm, the Pearson correlation analysis is used.

3. **Regression analysis:** A linear regression analysis is used to investigate the impact of working capital management on the profitability of firms. To conduct this analysis, the Fixed Effects Model (FEM) and the Pooled OLS regression are used. The FEM explains the variations of profitability within firms while the pooled OLS explains the variation of profitability between firms. For quantitative analysis especially in regression analysis, a pooled regression is conducted since the data has both time series and cross-sectional dimensions. The major benefit of using panel data is, more useful in studying the dynamics of adjustment, and it is better able to identify and measure effects that are simply not detectable in pure cross-sections or pure time-series data. Moreover, many variables can be more accurately measured at the micro-level, and biases resulting from aggregation over firms or individuals are eliminated (Brooks, 2008).

Several considerations will affect the choice between a fixed effects and a random effects model.(Williams R,2018)

1. What is the nature of the variables that have been omitted from the model?

a. If you think there are no omitted variables – or if you believe that the omitted variables are uncorrelated with the explanatory variables that are in the model then a random effects model is probably best. It will produce unbiased estimates of the coefficients, use all the data available, and produce the smallest standard errors. More likely, however, is that omitted variables will produce at least some bias in the estimates.

b. If there are omitted variables, and these variables are correlated with the variables in the model, then fixed effects models may provide a means for controlling for omitted variable bias. In a fixed-effects model, subjects serve as their own controls. The idea is that whatever effects the omitted variables have on the subject at one time, they will also have the same effect at a later time; hence their effects will be constant, or “fixed.” however, in order for this to be true, the omitted variables must have time-invariant values with time-invariant effects. By time-invariant effects, we mean the variable has the same effect across time.

Because there are omitted variables which are correlated with variables in this study model, Fixed effect model is preferred than Random effect model. Because Fixed effect model provides a means for controlling omitted variable bias.

2. How much variability is there within subjects?

a. If subjects change little, or not at all, across time, a fixed effects model may not work very well or even at all. There needs to be within-subject variability in the variables if we are to use subjects as their own controls. If there is little variability within subjects then the standard errors from fixed effects models may be too large to tolerate.

b. Conversely, random effects models will often have smaller standard errors. But, the trade-off is that their coefficients are more likely to be biased.

Because there exists within subject variability in the variables, fixed-effect model is selected.

3. Do we wish to estimate the effects of variables whose values do not change across time, or do we merely wish to control for them?

a. With fixed effects models, we do not estimate the effects of variables whose values do not change across time. Rather, we control for them or “partial them out.”

b. Random effects models will estimate the effects of time-invariant variables, but the estimates may be biased because we are not controlling for omitted variables.

Because we do not estimate the effect of variables whose value do not change across time rather we control them, again fixed effect model is selected.

Using Fixed effects has its own disadvantages

1. Fixed Effect does not have a remedy for all sources of endogeneity bias.

➤ time-varying measurement error

2. Fixed Effect trades consistency for efficiency.

➤ FE uses only within-unit change, ignores between-unit variation.

➤ Parameter estimates may be imprecise, standard errors are large.

3. Fixed effects methods are inefficient. They throw away information.

Pooled OLS model, in this model cross-section coefficients contain information about average differences between units, it is a population-averaged effect.

.Model Specification

Since the study seeks to establish the relationship between working capital management components and profitability of construction companies over six year period, the study uses panel data regression analysis of cross-sectional and time-series data. 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. This is consistent with (Raheman & Nasr,2007) The general models for the\ study are:

Model for Cash Conversion Cycle (CCC) using dependent variables (NOP and ROA) and control variables (logarithm of sales, fixed assets ratio, and debt ratio)

$$NOP_{it} = \alpha_0 + \alpha_i(CCC_{it}) + \alpha_{ii}(\text{LnSales}_{it}) + \alpha_{iii}(FAR_{it}) + \alpha_{iv}(FDR_{it}) \quad \text{Model 1}$$

$$ROA_{it} = \alpha_0 + \alpha_i(CCC_{it}) + \alpha_{ii}(\text{LnSales}_{it}) + \alpha_{iii}(FAR_{it}) + \alpha_{iv}(FDR_{it}) \quad \text{Model 2}$$

Model for Accounts Payable (AP) using dependent variables (NOP and ROA) and control variables (logarithm of sales, fixed assets ratio, and debt ratio)

$$NOP_{it} = \alpha_0 + \alpha_i(AP_{it}) + \alpha_{ii}(\text{LnSales}_{it}) + \alpha_{iii}(FAR_{it}) + \alpha_{iv}(FDR_{it}) \quad \text{Model 3}$$

$$ROA_{it} = \alpha_0 + \alpha_i(AP_{it}) + \alpha_{ii}(\text{LnSales}_{it}) + \alpha_{iii}(FAR_{it}) + \alpha_{iv}(FDR_{it}) \quad \text{Model 4}$$

Model for Accounts Receivables (AR) using dependent variables (NOP and ROA) and control variables (logarithm of sales, fixed assets ratio, and debt ratio)

$$NOP_{it} = \alpha_0 + \alpha_i(AR_{it}) + \alpha_{ii}(\text{LnSales}_{it}) + \alpha_{iii}(FAR_{it}) + \alpha_{iv}(FDR_{it}) \quad \text{Model 5}$$

$$ROA_{it} = \alpha_0 + \alpha_i(AR_{it}) + \alpha_{ii}(\text{LnSales}_{it}) + \alpha_{iii}(FAR_{it}) + \alpha_{iv}(FDR_{it}) \quad \text{Model 6}$$

Model for Inventory Conversion Period (INV.COV) using dependent variables (NOP and ROA) and control variables (logarithm of sales, fixed assets ratio, and debt ratio)

$$NOP_{it} = \alpha_0 + \alpha_i(INV.COV_{it}) + \alpha_{ii}(\text{LnSales}_{it}) + \alpha_{iii}(FAR_{it}) + \alpha_{iv}(FDR_{it}) \quad \text{Model 7}$$

$$ROA_{it} = \alpha_0 + \alpha_i(INV.COV_{it}) + \alpha_{ii}(\text{LnSales}_{it}) + \alpha_{iii}(FAR_{it}) + \alpha_{iv}(FDR_{it}) \quad \text{Model 8}$$

Where: NOP = Net operating profit, ROA= Return on Assets, CCC= Cash Conversion cycle, Ln Sales=firm size, FAR=fixed assets ratio and FDR= financial debt ratio, AR = number of days of Accounts Receivables, AP = number of days of Accounts Payables α_0 = the intercept of equation, α_i = Coefficients of variables i = Construction firms= 1,2,3,4 firms and t : Time= 1,2,3,4,5,6 years.

Chapter Four

Data Analysis, Result and Discussion

4.1 Descriptive statistics

Table 2 provides the descriptive statistics of the collected variables of 17 Local class 1 construction firms from the year 2013 to 2018 which I have collected. Total observations come to 17 firms x 6 years = 102 observations.

Table 2 Descriptive Statistics

Variables	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
NET Profit	102	-425468	48564744.5	6545491.25	9067500.24	2.672	.239
Inventory	102	0	168	30.21	34.796	2.039	.240
Return on Asset	102	0.00	.24	.0460	.04674	2.417	.239
Average Collection Period	102	19.00	3234.40	355.4676	455.34446	4.307	.239
Average Payment Period	102	19	1613	228.67	281.568	3.464	.239
Cash Conversion Period	102	-685	2909	156.50	391.741	3.828	.239
Fixed Asset Ratio	102	.022	6.240	.45554	1.132808	4.179	.239
Debt Ratio	102	.040	5.050	1.03324	1.109501	2.590	.239
Log (Sales)	102	13.040	20.920	18.43946	1.253944	-.698	.239

Source: source SPSS output from financial statements of sample companies, 2013 - 2018

Where NOP=Net operating profit ROA = return on Assets; ACP = Average collection period; INV = number of days of inventories; APP = Average payment period; CCC = number of days of Cash Conversion Cycle; Ln(Sales) = Firm Size; FAR = Fixed Assets Ratio; DR =Debt Ratio

The interpretation of table is as follows:

The credit period that firms granted their customers ranged on an average at 356 days with a standard deviation of 455.34 days. Minimum time that firms take to collect the receivables is 19 day and maximum 3234 days. The firms themselves take an average of 229 days to pay their bills to suppliers and a standard deviation of 282 days. The inventories took an average of 30 days to be sold and a standard deviation of 35 days. Overall the Cash Conversion cycle is ranged at an average of 157 days which indicates the average firm collects from their customers 157 days after paying the suppliers.

The average size of a firm is 18.5 as measured by its natural logarithm of its total turnover while the standard deviation is 1.26. The maximum value of natural logarithm of sales for a company in a year is 20.9 and the minimum is 13.04. The average firm in the sample has a fixed asset ratio of 0.455. The mean debt ratio is 1.033. We need to convert the two ratios (FAR and DR) to percentages because ratios compare two parts of a whole against each other, but the variables needs to be compared as one part with the whole , as a result the average firm in the sample has a fixed asset ratio of $0.455 \times 100 = 45.55\%$. The mean debt ratio is $1.033 \times 100 = 103.3\%$.

4.2 The correlation analysis

Table 3 The correlation matrix

	NOP	INV	ACP	APP	ROA	CCC	Ln sales	FAR	DR
NOP	1								
INV	0.016	1							
ACP	-0.109	0.048	1						
APP	-0.057	-0.007	0.531**	1					
ROA	0.041	-0.194	-0.179	-0.179	1				
CCC	-0.170	0.149	0.786**	-0.102	-0.097	1			
Ln sales	0.448**	0.151	-0.431**	-0.370**	0.087	-0.221*	1		
FAR	-0.158	-0.167	-0.184	-0.158	0.700**	-0.116	0.045	1	
DR	-0.109	-0.061	-0.181	-0.131	0.429**	-0.122	0.433**	0.368**	1

* Correlation is significant at the 0.05 level.

** Correlation is significant at the 0.01 level.

NOP=Net operating profit ROA = return on Assets; ACP = Average collection period; INV = number of days of inventories; APP = Average payment period; CCC = number of days of Cash Conversion Cycle; Lnsales = Firm Size; FAR = Fixed Assets Ratio; DR = Debt Ratio

Table 3 presents the Pearson correlation coefficients for all the variables mentioned. There is a negative relation between the Return on Assets (ROA) and capital components Average collection period and average payment period in contrary to net operating profit (NOP) which shows positive relation with number of days of inventories. This finding is consistent with the research of Ephrem Assefa(2018). However, the relationship between ROA and cash conversion cycle is negative. The result of the correlation analysis shows a significant negative coefficient (-0.179) between Average collection period and ROA. This means that if the number of days of ACP increases, it will make the profitability of the company decrease. The correlation result also indicates a negative and significant relation between inventories and ROA. This demonstrates that if firms take a long period of time to sell its inventories, the profitability will consequently decrease.

Furthermore, there is insignificant coefficient (-0.179) between APP (Average payment Period) and ROA. This means that if APP increases, profitability of a company will decrease. NOP shows Negative and insignificant relationship with APP. This means early payment to suppliers might increase the profitability of the company due to large discounts the supplier offers to the firms for punctual payments. The result is consistent with Raheman and Naser (2007).

The cash conversion cycle shows a negative and significant coefficient with NOP and ROA. This indicates that when cash conversion cycle increases profitability will decrease.

The analysis also shows a significant positive and insignificant positive correlation between natural logarithm of sales which is used to measure the size of the firm and the profitability NOP and ROA. Their coefficient correlation is 0.448 and 0.087 respectively. This shows that as size of the firm increases, it will increase its profitability and vice versa (Dong and Su, 2010).

The results show that the financial debt ratio has insignificantly negative correlation (-0.109) with the profitability, indicating that an increase in debt is associated with a decrease in the profitability. And finally, the FAR (fixed assets ratio) has a significant positive correlation with ROA.

As stated earlier in above paragraph, the Pearson correlation analysis shows the relationship between the variables, it does not identify the causes from consequences (Shin and Soenen, 1998; Deloof, 2003; Mathuva, 2009; Dong and Su, 2010). According to Mathuva (2009) it is hard to determine whether a shorter accounts collection period leads to higher profitability or a higher profitability is as a result of the short accounts receivable period. Hence, regression analysis is carried out in the next section to determine the impact of working capital management on corporate profitability.

4.3 The regression analysis

In line with the research of Deloof (2003), the determinants of the corporate profitability are estimated with pooled OLS. Also the fixed effects model is used to determine the impact of the independent variables on the dependent variables. These two models are used for comparison purposes. Panel data methodology assumes that individuals firms are heterogeneous (Mathuva, 2009). Time-series and cross-section data studies in which the heterogeneity are not taken into account run the risk of getting biased results. Also, panel data give more informative data, more variability, less co linearity among the variables, more degrees of freedom and more efficiency (Baltagi, 2005). The impact of working capital management on the profitability is modeled using the following regression equations:

$$\text{ROA} = f(\text{INV}, \text{ACP}, \text{APP}, \text{CCC}, \text{LnSales}, \text{FAR}, \text{DR})$$

$$\text{NOP} = f(\text{INV}, \text{ACP}, \text{APP}, \text{CCC}, \text{LnSales}, \text{FAR}, \text{DR})$$

Model for Cash Conversion Cycle (CCC) using dependent variables (NOP and ROA) and control variables (Natural logarithm of sales, fixed assets ratio and debt ratio)

$$\text{NOP}_{it} = \alpha_0 + \alpha_i(\text{CCC}_{it}) + \alpha_{ii}(\text{LnSales}_{it}) + \alpha_{iii}(\text{FAR}_{it}) + \alpha_{iv}(\text{DR}_{it}) \quad \text{Model 1}$$

$$\text{ROA}_{it} = \alpha_0 + \alpha_i(\text{CCC}_{it}) + \alpha_{ii}(\text{LnSales}_{it}) + \alpha_{iii}(\text{FAR}_{it}) + \alpha_{iv}(\text{DR}_{it}) \quad \text{Model 2}$$

Model for Accounts Payable (APP) using dependent variables (NOP and ROA) and control variables (Natural logarithm of sales, fixed assets ratio and debt ratio)

$$\text{NOP}_{it} = \alpha_0 + \alpha_i(\text{APP}_{it}) + \alpha_{ii}(\text{LnSales}_{it}) + \alpha_{iii}(\text{FAR}_{it}) + \alpha_{iv}(\text{DR}_{it}) \quad \text{Model 3}$$

$$\text{ROA}_{it} = \alpha_0 + \alpha_i(\text{APP}_{it}) + \alpha_{ii}(\text{LnSales}_{it}) + \alpha_{iii}(\text{FAR}_{it}) + \alpha_{iv}(\text{DR}_{it}) \quad \text{Model 4}$$

Model for Accounts Receivables (ACP) using dependent variables (NOP and ROA) and control variables (Natural logarithm of sales, fixed assets ratio and debt ratio)

$$\text{NOP}_{it} = \alpha_0 + \alpha_i(\text{ACP}_{it}) + \alpha_{ii}(\text{LnSales}_{it}) + \alpha_{iii}(\text{FAR}_{it}) + \alpha_{iv}(\text{DR}_{it}) \quad \text{Model 5}$$

$$\text{ROA}_{it} = \alpha_0 + \alpha_i(\text{ACP}_{it}) + \alpha_{ii}(\text{LnSales}_{it}) + \alpha_{iii}(\text{FAR}_{it}) + \alpha_{iv}(\text{DR}_{it}) \quad \text{Model 6}$$

Model for Inventory Conversion Period (INV.CONV) using dependent variables (NOP and ROA) and control variables (Natural logarithm of sales, fixed assets ratio and debt ratio)

$$NOP_{it} = \alpha_0 + \alpha_i(INV.COV_{it}) + \alpha_{ii}(\ln Sales_{it}) + \alpha_{iii}(FAR_{it}) + \alpha_{iv}(DR_{it}) \quad \text{Model 7}$$

$$ROA_{it} = \alpha_0 + \alpha_i(INV.COV_{it}) + \alpha_{ii}(\ln Sales_{it}) + \alpha_{iii}(FAR_{it}) + \alpha_{iv}(DR_{it}) \quad \text{Model 8}$$

Where: NOP=Net operating profit ROA = return on Assets; ACP = Average collection period; INV = number of days of inventories; APP = Average payment period; CCC = number of days of Cash Conversion Cycle; Lnsales = Firm size; FAR = Fixed Assets Ratio; DR = Debt Ratio α_0 = The intercept of equation α_i = Coefficients of With variables i = Construction firms = 1,2,3,4 firms and t : Time = 1, 2, 3,4,5,6 years

ROA measures the Return on Assets, size of the company is measured by the natural logarithm of Sales, FAR the Fixed Assets Ratio, the DR the Debt Ratio, ACP as the average of collection period, APP as the average payment period number of days of accounts payables, and CCC as the number of days of the cash conversion cycle. The subscript i denotes firms (cross section dimensions) ranging from 1–102 and t denoting years (time-series dimension) ranging from 2013–2018.

4.3.1 Pooled OLS regression

Table 4 Pooled OLS Regression for NOP and independent variables and control Variables

Model 1	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-121242880.387	18287291.979		-6.630	.000		
CCC	-9578.000	2912.606	.270	3.288	.001	.940	1.064
Log (Sales)	7339697.957	1008558.858	.662	7.277	.000	.765	1.307
Fixed Asset Ratio	-316681.973	1066118.034	-.026	-.297	.076	.839	1.192
Debt Ratio	-4427341.070	1199928.434	-.354	-3.690	.000	.690	1.449
Model 3	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-120038287.437	20460187.468		-5.867	.000		
Log (Sales)	7283474.023	1110489.484	.657	6.559	.000	.686	1.458
Fixed Asset Ratio	-388456.918	1123885.307	-.032	-.346	.073	.821	1.219
Debt Ratio	-4567954.582	12578;49.503	-.365	-3.632	.000	.683	1.464
APP	6599.502	4485.366	.134	1.471	.144	.834	1.199
Model 5	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-146925893.496	19436186.220		-7.559	.000		
Log (Sales)	8599942.333	1051400.250	.776	8.180	.000	.655	1.527
Fixed Asset Ratio	221688.799	1043954.636	.018	.212	.082	.814	1.228
Debt Ratio	-4805541.816	1161721.804	-.384	-4.137	.000	.685	1.459
ACP	-11503.908	2650.112	.377	4.341	.000	.782	1.279
Model 7	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-110487647.103	18744359.480		-5.894	.000		
Log (Sales)	6938566.643	1050469.511	.628	6.605	.000	.771	1.297
Fixed Asset Ratio	868040.293	1118586.161	.071	.776	.044	.833	1.200
Debt Ratio	-4557456.793	1259859.677	-.364	-3.617	.000	.685	1.459
Inv. Conversion Period	-45246.922	34443.466	-.113	-1.314	.192	.941	1.063

Source: source SPSS output from financial statements of sample companies, 2013 - 2018

Where: NOP=Net operating profit ROA = return on Assets; ACP = Average collection period; INV = number of days of inventories; APP = Average payment period; CCC = number of days of Cash Conversion Cycle; Lnsales = Firm Size; FAR = Fixed Assets Ratio; DR = Debt Ratio

The relationship between NOP and ACP

With a total of 102 observations, the pooled OLS regression indicates a significant relationship between NOP and ACP. Looking at the coefficient, there is a negative relationship between NOP and ACP (-11503.908) which is consistent with the finding of Lazaridis and Tryfonidis(2006) and Raheman and Naser(2007).The coefficients for each of the variables indicates the amount of change expected in NOP given a one-unit change in the value of that variable, given that all other variables in the model are held constant. This means, with all other variables held constant, if the ACP increases by one unit (one day) then the NOP will decrease with 11503.908.Which shows slow collection of account receivables is correlated with low profitability. Thus, firms improve their profitability by decreasing the credit period granted to their customers. This result is in line with the hypothesis in this study where negative relationship between profitability and ACP was expected.

The relationship between NOP and APP

Looking at coefficients of the above table, the relationship between NOP and APP is insignificant. The coefficient is 6599.502, indicating a positive relationship between NOP and APP. This result is consistent with study of the Garcia-Teruel and Martinez-Solano (2007). The positive relationship means increase in average payment period of accounts payables will result in a increase of the NOP and vice versa. When firms delay their payments they earn more profits. Meaning increase in availability of funds caused by the delayed payment of accounts payables can thus be used for productive purposes that can increase profitability. This result is in line with the hypothesis in this study where a positive relationship between profitability and APP was expected.

The relationship between NOP and CCC

The relationship between CCC and NOP is Negative and statistically significant. This model shows the effect of all the remaining independent variables combined (ACP, INV and APP) on the profitability of the firms. The Negative result is in line with the hypothesis in which a negative relationship between CCC and profitability was expected. However, the Negative relationship between these two variables is consistent with Raheman and Naser (2007) and Garcia and Teruel (2007) who found that shortening the cash conversion cycle is associated with higher profitabiity.

The relationship between NOP and Inv.Conv Period

The regression analyses of inventory conversion period indicate that there is a negative and insignificant relation between these days and firm's profitability. The negative result means that the shorter the firm's inventory holding period, the higher the profitability and vice versa. This result is consistent with Gill et al(2010) and Mifta Ahmed(2016). Therefore, firms can increase their profitability by reducing the inventory conversion period as much as possible. In another way, firms should faster the speed of inventory turnover to maximize profitability.

The relationship between NOP and the control variables

With reference to the control variables, Firm size and Debt Ratio are significant. The firm size was positively significant with the profitability. This means that larger firms generate higher profitability. The amount of leverage a company uses in its operations (Debt Ratio) is generally negative and statistically significant which indicates that more debt results in lower profitability.

Table 5 Pooled OLS Regression for ROA and independent variables and control Variables

Model 2	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	.049	.054		.914	.363		
CCC	-7.891E-07	.000	-.007	-.092	.027	.940	1.064
Log (Sales)	.001	.003	.035	.442	.006	.765	1.307
Fixed Asset Ratio	-.026	.003	-.622	-8.133	.000	.839	1.192
Debt Ratio	-.009	.004	-.214	-2.541	.013	.690	1.449
Model 4	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	.073	.058		1.270	.207		
Log (Sales)	.002	.003	.066	.787	.043	.686	1.458
Fixed Asset Ratio	-.025	.003	-.608	-7.912	.000	.821	1.219
Debt Ratio	-.009	.004	-.223	-2.646	.009	.683	1.464
APP	1.302E-05	.000	-.078	-1.028	.306	.834	1.199
Model 6	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	.067	.059		1.120	.265		
Log (Sales)	.002	.003	.058	.671	.050	.655	1.527
Fixed Asset Ratio	-.025	.003	-.612	-7.908	.000	.814	1.228
Debt Ratio	-.009	.004	-.219	-2.592	.011	.685	1.459
ACP	-5.33597E-06	.000	-.052	-.658	.005	.782	1.279
Model 8	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	.041	.053		.779	.438		
Log (Sales)	.001	.003	.018	.221	.08	.771	1.297
Fixed Asset Ratio	-.025	.003	-.615	-8.033	.000	.833	1.200
Debt Ratio	-.009	.004	-.204	-2.418	.017	.685	1.459
Inv. Conversion Period	.000	.000	-.076	-1.055	.294	.941	1.063

Source: source SPSS output from financial statements of sample companies, 2013 - 2018

Where: NOP=Net operating profit ROA = return on Assets; ACP = Average collection period; INV = number of days of inventories; APP = Average payment period; CCC = number of days of Cash Conversion Cycle; Lnsales = Firm Size; FAR = Fixed Assets Ratio; DR = Debt Ratio

The relationship between ROA and ACP

With a total of 102 observations, the pooled OLS regression indicates significant relationship between ROA and ACP. Looking at the coefficient, there is a Negative relationship between ROA and ACP (-5.33597×10^{-6}). The coefficients for each of the variables indicates the amount of change expected in ROA given a one-unit change in the value of that variable, given that all other variables in the model are held constant. This means, with all other variables held constant, if the ACP increases by one unit (one day) then the ROA will decrease with 5.33597×10^{-6} . This Negative result is consistent with Deloof (2003) and Lazaridis and Tryfonidis (2006). Less profitable firms will pursue a decrease of their account receivables in an attempt to reduce their cash gap. Thus, firms improve their profitability by decreasing the credit period granted to their customers.

The relationship between ROA and APP

Looking at coefficients table the relationship between ROA and APP is insignificant level. The coefficient is 1.302×10^{-5} , indicating a positive relationship between ROA and APP. This result is consistent with studies of the following researchers: Deloof, 2003; Lazaridis and Tryfonidis, 2006; and Sharma and Kumar, 2011. The positive relationship means an increase in the number of days of accounts payables will result in a increase of the profitability and vice versa. This is in line to the hypothesis in this research where a positive relationship between ROA and APP was expected.

The relationship between ROA and CCC

The relationship between CCC and ROA is Negative and significant. This model shows the effect of all the remaining independent variables combined (ACP, INV and APP) on the profitability of the firms. The Negative result is in line with the hypothesis in which a negative relationship between CCC and profitability was expected. The Negative relationship between these two variables is consistent with Garcia-Teruel and Martinez Solano (2007). The result indicate that shortening the cash conversion cycle is associated with higher profitability.

The relationship between ROA and Inv.Conv Period

The regression analyses of inventory conversion period indicate that there is a negative and insignificant relation between these days and firm's profitability. The negative relation means that the shorter the firm's inventory holding period, the higher the profitability and vice versa. This result is consistent with Gill et al(2010) and Mifta Ahmed(2016). Therefore, firms can increase their profitability by reducing the inventory conversion period as much as possible. In another way, firms should faster the speed of inventory turnover to maximize profitability.

The relationship between ROA and the control variables

With reference to the control variables, Firm size and Debt Ratio are significant. The firm size was positively and significantly with the profitability. This means that larger firms generate higher profitability. The amount of leverage a company uses in its operations (Debt Ratio) is generally negatively and statistically significant which indicates that more debt results to minimize profitability.

4.3.2 Fixed Effect regression

Table 6 The Fixed Effect Model for NOP and independent variables and control Variables

Model 1	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
Log (Sales)	1038166.745	110648.050	-13.737	-9.383	.011	.001	932.049
Fixed Asset Ratio	44048029.419	3469830.196	4.364	12.695	.006	.019	51.370
Debt Ratio	-21193632.96	2363232.092	-10.998	-8.968	.012	.002	653.858
CCC	-1254.962	245.433	-.436	-5.113	.036	.317	3.159
Model 3	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
Log (Sales)	829934.251	467600.080	-10.982	-1.775	.021	.001	1218.909
Fixed Asset Ratio	37710372.014	15143370.004	3.736	2.490	.130	.014	71.649
Debt Ratio	-15992497.58	9031919.822	-8.299	-1.771	.021	.001	699.361
APP	675.556	2735.070	.139	.247	.828	.100	10.047
Model 5	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
Log (Sales)	915701.711	66045.175	12.117	13.865	.005	.001	770.185
Fixed Asset Ratio	39740927.086	2054469.590	3.937	19.344	.003	.024	41.769
Debt Ratio	-19268093.54	1429149.598	-9.999	-13.482	.005	.002	554.610
ACP	-1386.781	174.333	-.662	-7.955	.015	.143	6.978
Model 7	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
Log (Sales)	1022745.393	239356.228	13.533	4.273	.051	.001	982.157
Fixed Asset Ratio	28116443.954	7177939.750	2.785	3.917	.059	.020	49.504
Debt Ratio	-17867015.162	4466801.470	-9.271	-4.000	.057	.002	526.022
Inventory Conversion Period	-217642.811	104496.521	-2.602	-2.083	.173	.007	152.810

Source: source SPSS output from financial statements of sample companies, 2013 - 2018

Where: NOP=Net operating profit ROA = return on Assets; ACP = Average collection period; INV = number of days of inventories; APP = Average payment period; CCC = number of days of Cash Conversion Cycle; Lnsales = Firm Size; FAR = Fixed Assets Ratio; DR = Debt Ratio

The relationship between ACP and NOP

The FEM model regression indicates a Negative relationship between NOP and ACP and significant. The negative result denotes that, with all other variables held constant, if the ACP increases by one unit (one day) then the NOP will decrease with 1386.78. This negative result is consistent with Gill et al(2010) and Garcia-Teruel and Martinez-Solano (2007). Less profitable firms will pursue a decrease of their account receivables in an attempt to reduce their cash gap. Thus, firms improve their profitability by decreasing the credit period granted to their customers.

The relationship between NOP and APP

The Fixed effect model shows that NOP and APP have a positive and insignificant relationship. The positive relationship suggests that if firms wait longer to pay their bills to suppliers the profitability will increase.

The relationship between NOP and CCC

In the fixed effect model regression show that the relationship between CCC and NOP is Negative and statistically significant. The finding is consistent with Raheman and Naser(2007). The Negative result denotes that a shorter cash conversion cycle results in an increase of the profitability and vice versa.

The relationship between NOP and Inv.Conv Period

The regression analyses of inventory conversion period indicate that there is a negative and insignificant relation between these days and firm's profitability. The negative result means that the shorter the firm's inventory holding period, the higher the profitability and vice versa. This result is consistent with Beemnet Kumelachew(2018) and Mifta Ahmed(2016). Therefore, firms can increase their profitability by reducing the inventory conversion period as much as possible. In another way, firms should faster the speed of inventory turnover to maximize profitability.

The relationship between NOP and the control variables

The Fixed effect model presents. Most(Log Sales, Debt Ratio) control variables in all models are statistically significant. The Debt Ratio is negatively (significant) related with the

profitability and the firm size measured by the natural logarithm of sales (LOS) is positively related with profitability.

Table 7 The Fixed Effect Model for ROA and independent variables and control Variables

Model 2	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
Log (Sales)	.002	.001	3.921	2.753	.011	.001	932.049
Fixed Asset Ratio	.148	.022	2.248	6.723	.021	.019	51.370
Debt Ratio	-.037	.015	-2.965	-2.485	.031	.002	653.858
CCC	-9.266E-06	.000	-.493	-5.948	.027	.317	3.159
Model 4	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
Log (Sales)	.001	.003	2.868	.467	.008	.001	1218.909
Fixed Asset Ratio	.136	.098	2.058	1.384	.030	.014	71.649
Debt Ratio	-.016	.058	-1.295	-.279	.050	.001	699.361
APP	1.409E-05	.000	.444	.797	.509	.100	10.047
Model 6	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
Log (Sales)	.001	.001	1.812	.683	.050	.001	770.185
Fixed Asset Ratio	.112	.041	1.707	2.762	.011	.024	41.769
Debt Ratio	-.019	.028	-1.528	-.678	.051	.002	554.610
ACP	-9.071E-06	.000	-.663	-2.626	.020	.143	6.978
Model 8	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
Log (Sales)	.002	.001	4.243	2.150	.016	.001	982.157
Fixed Asset Ratio	.023	.029	.353	.797	.050	.020	49.504
Debt Ratio	-.016	.018	-1.267	-.877	.047	.002	526.022
Inv. Conversion Period	-.002	.000	-3.350	-4.303	.55	.007	152.810

Source: source SPSS output from financial statements of sample companies, 2013 – 2018

Where: NOP=Net operating profit ROA = return on Assets; ACP = Average collection period; INV = number of days of inventories; APP = Average payment period; CCC = number of days of Cash Conversion Cycle; Lnsales = Firm Size; FAR = Fixed Assets Ratio; DR = Debt Ratio

The relationship between ACP and ROA

The FEM model regression indicates a Negative relationship between ROA and ACP and significant. The negative result denotes that, with all other variables held constant, if the ACP increases by one unit (one day) then the ROA will decrease with 9.071×10^{-06} . This Negative result is consistent Raheman and Naser (2007) .less profitable firms will pursue a decrease of their account receivable in an attempt to reduce their cash gap.

The relationship between ROA and APP

The Fixed effect model shows that ROA and APP have a positive and insignificant relationship. The finding is consistent with Beemnet Kumelachew(2018). The positive relationship posits that if firms wait longer to pay their bills to suppliers the profitability will increase.

The relationship between ROA and CCC

The fixed effect model regression show that the relationship between CCC and ROA is Negative and statistically significant which is consistent with Lazaridis and Tryfonidis(2006). The Negative result denotes that shortening cash conversion cycle is associated with higher profitability.

The relationship between ROA and Inv.Conv Period

The regression analyses of inventory conversion period indicate that there is a negative and insignificant relation between these days and firm's profitability. The negative result means that the shorter the firm's inventory holding period, the higher the profitability and vice versa. This result is consistent with Beemnet Kumelachew(2018) and Mifta Ahmed(2016). Therefore, firms can increase their profitability by reducing the inventory conversion period as much as possible. In another way, firms should faster the speed of inventory turnover to maximize profitability.

The relationship between ROA and the control variables

With reference to the control variables, Firm size and Debt Ratio are significant. The firm size was positive and significant with the profitability. This means that larger firms generate higher profitability. The amount of leverage a company uses in its operations (Debt Ratio) is generally negatively and statistically significant which indicates that more debt results in minimize profitability.

Chapter Five

CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

The purpose of this study was to determine the relationship between the working capital management components and profitability within local class one construction firms in Addis Ababa. Data was analyzed using descriptive statistics, correlation and regression analysis on a sample of 17 local class one construction companies in Addis Ababa for the period of 2013-2018. The study used return on asset and net operating profit as dependent variable. Accounts receivable period, inventory turnover in days, average payment period and cash conversion cycle were used as independent working capital management variables. In addition, the study used firm size, financial debt ratio, fixed asset ratio as control variables. Based on the findings in this study, the following conclusions are derived regarding the relationship between the working capital components and the profitability of local class one construction firms in Addis Ababa:

- There is a negative and significant relation between the firm profitability as measured by NOP and ROA and the average collection period. The profitability of local class one construction firms is improved when the management reduces the average collection period. By shortening average collection period cash can be generated faster in order to execute more company activities and thus increase the profitability. Consequently, firms with more profits will lead to more accounts receivables because the firms with higher profits have more cash ,can give more credit to their customers.
- There is positive and insignificant relation between the firm profitability measured by NOP and ROA and the average payment period. The positive result shows that when firms delay their payments they earn more profits.
- There is Negative and significant relation between the firm profitability measured by NOP and ROA and the cash conversion cycle. This means that the shorter the firm's cash conversion cycle, the higher the profitability and vice versa.

-There is negative and insignificant relation between Inventory conversion period and firm's profitability. The negative result means that the shorter the firm's inventory holding period, the higher the profitability and vice versa

- There is positive relation between firm size and firm profitability measured by NOP. Bigger firms generate higher profits than smaller firms. This can be explained by the economies of scale. Bigger companies have more funds to give credit to customers and have high inventories hence generate more profits.

- The negative correlation between the profitability as measured by NOP and the debt ratio implies when the leverage in firms increase, it will have an adverse effect on the profitability of firms.

-Therefore construction firms in Addis Abeba can increase their profitability by shortening cash conversion cycle and average collection period.

5.2 RECOMMENDATIONS

- Average collection period will decrease firms' profitability, if there is low collection of account receivables. Therefore, companies have to adopt neither liberal credit nor conservative policy so as to minimize bad debt and hence, increase firms' profitability .
- CCC has a negative relationship with firms' profitability. Therefore, regarding the CCC, the researcher recommended that lowering working capital cycle as a measure of efficient working capital management is the one to be valued.
- The study also found positive relationship between accounts payable period and firms' profitability. It indicates that whenever firms wait longer to pay their account payables, it increases profitability.
- The study found negative relationship between inventory conversion period and firms' profitability. It is apparent that higher inventory conversion period is associated with higher storage, carrying cost and also prone to spoilage. The researcher recommended the firms should work on bettering the inventory management system that minimizes the holding period.

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APPENDIX 1A: DATA COLLECTION FOR THE DEPENDENT AND THE INDEPENDENT VARIABLES

The Six year (2013-2018) data collection for each of the 17 local class one construction firms in the Addis Ababa embraces the following data: net income, Total Assets, Inventories, Costs of Goods Sold (COGS), Receivables, sales and Payables. With these data the Return on Assets (ROA), the inventory conversion period, the sales-to-cash conversion period (average collection period), the purchase-to-payment conversion period (average payment period) and the Cash Conversion Cycle period is calculated. The net income of firms is defined as the income after all expenses, including financing costs and taxes are deducted from the revenues (Melicher and Leach, 2009). The total assets are calculated by the summation of the total liabilities plus the owners' equity. The Inventories, the Receivables and the Payables is derived from the balance sheets of the firms. Costs of Goods Sold are seen as the direct costs of producing a product or providing a service (Melicher and Leach, 2009). The sales of a firm comprises of the total revenues a firm has generated through selling its products and services.

FOR THE YEAR ENDED JULY 2013/SENE 2005

S. No.	FIRM	NET PROFIT	TOTAL ASSETS	ROA	INVENTORIES	COGS	INV.COV	RECEIVABLES	SALES	ACP	PAYABLES	APP	CCC
1	3M Engineering & Construction PLC	2,286,933	148,266,299	0.02	10,193,214	147,013,731	25	129,897,810	156,555,767	302.8	94,055,720	234	95
2	Adam Construction PLC	14,849,636	138,327,965	0.11	39,726,527	131,405,300	110	81,067,935	157,328,856	188.1	75,717,834	210	88
3	Afro-Tsion Construction PLC	27,759,161	955,113,772	0.03	41,413,497	657,647,311	23	712,241,466	738,528,072	352	821,610,672	456	-81
4	AMB Construction	2,928,942	98,352,327	0.03	5,600,745	104,938,853	19	57,889,936	119,482,484	176.8	84,945,471	295	-99
5	Bright Construction PLC	1,785,232	60,520,536	0.03	977,175	75,868,179	5	38,605,089	67,541,171	208.6	41,307,377	199	15
6	Beha Construction	1,723,297	46,525,889	0.04	4,581,754	58,479,798	29	31,363,755	68,771,604	166.5	39,544,656	247	-52
7	Bereket Endeshaw B.C.	2,223,910	100,236,401	0.02	25,152,805	86,798,870	106	37,631,471	102,308,991	134.3	43,250,685	182	58
8	FAL trading	4,422,413	142,540,314	0.03	272,314	8,924,532	11	69,826,911	28,191,242	904.1	39,121,655	1,600	-685
9	Flinstone Engineering	3,903,742	371,554,171	0.01	169,945,351	440,635,428	141	106,677,146	481,895,335	80.8	320,448,848	265	-44
10	Orbit Engineering Construction PLC	3,000,185	177,841,771	0.02	22,156,051	128,017,305	63	113,856,985	136,858,666	303.7	158,735,593	453	-86
11	Meson Construction	655,320	90,206,862	0.01	6,533,018	53,378,088	45	30,539,143	59,594,083	187	82,967,317	567	-336
12	NKH Construction PLC	16,038,546	191,495,268	0.08	31,106,409	436,797,067	26	19,652,379	136,589,365	52.5	94,566,398	79	-1
13	Rama Construction PLC	5,137,448	85,789,462	0.06	77,278,140	661,863,600	43	495,592,022	738,343,595	245	613,638,079	338	-51
14	Unity Engineering PLC	1,982,189	12,996,161	0.15	1211561	99,088,172	4.46	15,592,489	102,836,931	55.3	24,029,080	89	-33
15	Yotek Construction PLC	12,348,150	514,861,170	0.02	92,396,717	546,758,876	62	252,606,533	606,239,037	152.1	449,588,091	300	-86
16	Zamra Construction PLC	30,436,739	629,921,752	0.05	82,218,419	496,110,382	60	421,250,939	623,263,447	246.7	538,245,861	396	-89
17	Zequala Construction	3,289,870	38,615,729	0.09	1,832,031	86,213,807	8	22,354,328	95,967,215.00	85	13,153,083	56	37

FOR THE YEAR ENDED JULY 2014/SENE 2006

S. No .	FIRM	NET PROFIT	TOTAL ASSETS	ROA	INVENTOR IES	COGS	INV. COV	RECEIVABLES	SALES	ACP	PAYABLES	APP	CCC
1	3M Engineering & Construction PLC	-450,468	229,166,752	0	5,847,735	150,646,212	14	195,420,264	159,072,215	448.4	217,183,682	526	-64
2	Adam Construction PLC	6,586,576	120,333,429	0.05	32,384,643	70,448,489	168	72,325,237	84,238,838	313.4	57,959,504	300	181
3	Afro-Tsion Construction PLC	48,564,745	1,060,677,715	0.05	66,448,930	1,094,076,726	22	755,726,947	1,222,247,031	225.7	961,068,641	321	-73
4	AMB Construction	5,164,173	126,412,960	0.04	5,433,430	114,610,998	17	69,882,128	130,373,329	195.6	106,619,330	340	-127
5	Bright Construction PLC	6,157,972	104,785,865	0.06	2,142,136	123,402,564	6	56,277,971	38,812,455	529.2	77,449,804	229	307
6	Beha Construction	5,248,278	68,283,003	0.08	4,968,984	80,586,531	23	45,698,401	97,941,078	170.3	47,295,468	214	-21
7	Bereket Endeshaw B.C.	7,085,175	75,794,133	0.09	4,223,636	106,510,922	14	60,778,873	142,014,563	156.2	48,325,000	166	5
8	FAL trading	5,837,586	173,899,184	0.03	313,161	10,887,929	10	83,792,293	-	2,809.00	48,119,636	1,613	1,206
9	Flinstone Engineering	461,275	428,035,381	0	171,229,184	400,488,527	156	169,104,611	133,809,946	461.3	407,224,050	371	246
10	Orbit Construction PLC	1,741,679	202,420,859	0.01		147,776,032	-	22,183,584	156,859,000	51.6	49,355,521	122	-70
11	Meson Construction	2,445,128	75,220,172	0.03	6,448,173	85,553,904	28	34,835,256	100,966,652	125.9	64,806,557	276	-123
12	NKH Construction PLC	1,200,090	212,428,516	0.01	37,113,178	510,916,341	27	60,394,655	123,568,958	178.4	102,499,678	73	132
13	Rama Construction PLC	13,320,306	107,037,990	0.12	59,345,756	850,582,795	25	355,029,410	954,989,552	135.7	520,493,965	223	-62
14	Unity Engineering PLC	3,584,960	15,084,960	0.24	1227864	114,096,965	3.93	32,464,098	121,594,105	97.5	39,911,829	128	-30
15	Yotek Construction PLC	32,925,173	636,318,710	0.05	91,257,677	735,015,485	45	344,016,044	814,248,144	154.2	502,347,970	249	-50
16	Zamra Construction PLC	40,607,162	573,132,404	0.07	89,003,683	457,841,479	71	359,838,440	40,607,162	3,234.40	497,069,937	396	2,909
17	Zequala Construction	1,781,535	69,404,111	0.03	1,529,616	54,192,919	10	34,987,600	64,025,780.00	199.5	25,753,521	173	36

FOR THE YEAR ENDED JUNE 2015/SENE 2007

S. No.	FIRM	NET PROFIT	TOTAL ASSETS	ROA	INVENTORIES	COGS	INV. COV	RECEIVABLES	SALES	ACP	PAYABLES	APP	CCC
1	3M Engineering & Construction PLC	2,416,382	251,215,927	0.01	9,101,084	187,094,056	17.76	129,897,810	117,910,790	402.11	36,131,384	70.49	349.37
2	Adam Construction PLC	15,690,181	166,597,900	0.09	35,789,664	111,407,462	117.26	81,067,935	62,744,663	471.59	72,965,077	239.05	349.79
3	Afro-Tsion Construction PLC	29,330,434	1,312,291,259	0.02	31,856,536	1,147,956,625	10.13	712,241,466	248,648,869	1045.52	330,768,832	105.17	950.48
4	AMB Construction	3,094,731	124,122,469	0.02	4,590,775	106,619,933	15.72	57,889,936	121,469,607	173.95	41,404,612	141.74	47.92
5	Beha Construction	1,820,842	53,994,694	0.03	3,393,892	80,831,882	15.33	31,363,755	55,337,230	206.87	9,100,810	41.10	181.10
6	Bereket Endeshaw B.C.	2,349,792	117,312,036	0.02	22,660,185	126,170,218	65.55	37,631,471	74,349,763	184.74	18,711,983	54.13	196.16
7	Bright Construction PLC	1,886,283	110,245,845	0.02	740,284	132,236,786	2.04	38,605,089	89,862,403	156.80	28,207,490	77.86	80.99
8	FAL trading	4,672,738	220,501,651	0.02	252142.59	9,972,626	9.23	69,826,911	32,299,627	789.07	32,472,277	1188.49	-390.19
9	Flinstone Engineering	4,124,709	544,312,996	0.01	157,356,806	547,121,433	104.98	106,677,146	156,786,370	248.35	105,363,554	70.29	283.03
10	Meson Construction	692,414	103,830,400	0.01	5,885,602	99,044,887	21.69	30,539,143	43,771,854	254.66	68,563,504	252.67	23.68
11	NKH Construction PLC	16,946,388	270,698,872	0.06	23,041,784	646,275,907	13.01	19,652,379	132,732,777	54.04	73,137,668	41.31	25.75
12	Orbit Engineering Construction PLC	3,170,007	245,932,748	0.01	17,043,116	176,206,500	35.30	113,856,985	100,324,889	414.23	32,009,982	66.31	383.23
13	Rama Construction PLC	5,428,247	124,104,336	0.04	67,198,383	1,009,068,701	24.31	495,592,022	942,363,500	191.95	291,473,885	105.43	110.83
14	Unity Engineering PLC	2,094,388	15,549,715	0.13	1244167	144,921,637	3.13	15,592,489	260,380,250	21.86	21,543,056	54.26	-29.27
15	Yotek Construction PLC	13,047,102	690,378,615	0.02	87,996,873	828,933,378	38.75	252,606,533	242,715,525	379.87	113,485,273	49.97	368.65
16	Zamra Construction PLC	32,159,573	806,907,894	0.04	76,128,166	594,249,847	46.76	421,250,939	165,262,500	930.38	339,065,041	208.26	768.88
17	Zequala Construction	3,476,089	64,053,228	0.05	1,696,325	74,351,277	8.33	22354328	99,157,500	82.29	3869425.6	19.00	71.62

FOR THE YEAR ENDED JUNE 2016/SENE 2008

S. No	FIRM	NET PROFIT	TOTAL ASSETS	ROA	INVENTORIES	COGS	INV. COV	RECEIVABLES	SALES	ACP	PAYABLES	APP	CCC
1	3M Engineering & Construction PLC	523580.15	293911558.00	0.00	7280867.14	212125655.80	12.53	141933969.11	44540220.20	1163.13	136556685.82	234.97	940.68
2	Adam Construction PLC	15961903.42	190220478.00	0.08	28631731.17	122970793.00	84.98	6545255.14	23586874.64	101.29	53104218.69	157.62	28.65
3	Afro-Tsion Construction PLC	44724179.78	1512834121.80	0.03	25485228.92	1321479687.40	7.04	18088859.26	342229168.68	19.29	268306161.76	74.11	-47.78
4	AMB Construction	4178885.24	133239207.20	0.03	3672619.67	110387684.80	12.14	10258491.79	36504532.12	102.57	80687038.10	266.79	152.08
5	Beha Construction	3504316.27	55403179.80	0.06	2715113.00	83525751.20	11.86	25180481.00	47423501.84	193.80	35688596.00	155.96	49.71
6	Bereket Endeshaw B.C.	5139672.19	135244791.20	0.04	18128148.00	147880788.00	44.74	34612881.00	39764077.67	317.72	26765273.00	66.06	296.40
7	Bright Construction PLC	4392847.04	130160090.60	0.03	592227.00	156345307.20	1.38	33692452.00	46665189.43	263.53	48775494.00	113.87	151.04
8	FAL trading	6512460.97	259774916.40	0.03	201714.07	10058731.80	7.32	48258449.44	55129157.00	319.51	4142039.46	150.30	176.53
9	Flinstone Engineering	2665487.75	620670825.40	0.00	125885445.18	622500584.60	73.81	113566956.07	43920520.00	943.79	258268143.28	151.43	866.17
10	Meson Construction	1518558.99	120687726.80	0.01	4708481.00	116580669.00	14.74	1429907.00	10867487.39	48.03	59225930.00	185.43	122.66
11	NKH Construction PLC	14362533.48	314469766.60	0.05	18433428.00	758428818.00	8.87	19506356.00	34599308.24	205.78	74678418.00	35.94	178.71
12	Orbit Engineering Construction PLC	3194222.59	287588119.80	0.01	23634492.92	200435319.40	43.04	13317870.00	28270662.56	171.95	49187605.00	89.57	125.41
13	Rama Construction PLC	9353750.49	144457578.40	0.06	53758706.08	1185813582.60	16.55	258113965.18	567397074.67	166.04	502078951.29	154.54	28.05
14	Unity Engineering PLC	3411366.11	16551846.20	0.21	1260470	170650673.60	2.70	6019628.63	34046349.40	64.53	17680035.76	37.82	29.42
15	Yotek Construction PLC	25099916.45	778096763.20	0.03	70397498.66	954866741.20	26.91	91804484.89	227989480.32	146.97	192461301.33	73.57	100.32
16	Zamra Construction PLC	46134418.72	930015608.00	0.05	60902532.59	685788813.20	32.41	22996801.26	451370005.36	18.60	232079223.14	123.52	-72.51
17	Zequala Construction	3735402.57	70825939.60	0.05	1357060.00	79215439.60	6.25	30855375.10	17927218.40	628.22	19799380.86	91.23	543.24

FOR THE YEAR ENDED JUNE 2017/SENE 2009

S. No.	FIRM	NET PROFIT	TOTAL ASSETS	ROA	INVENTORIES	COGS	INV. COV	RECEIVABLES	SALES	ACP	PAYABLES	APP	CCC
1	3M Engineering & Construction PLC	38,606	336,607,189	0.00	9,146,413	237,157,256	14.08	194,797,241	113,512,218	626.37	149,205,304	229.64	410.81
2	Adam Construction PLC	18,104,031	213,843,056	0.08		134,534,124	0.00	67,647,834	64,746,368	381.36	73,474,295	199.34	182.02
3	Afro-Tsion Construction PLC	50,096,937	1,713,376,985	0.03	42,453,412	1,495,002,750	10.36	528,252,199	582,118,185	331.22	566,448,542	138.30	203.29
4	AMB Construction	4,545,212	142,355,950	0.03	1,894,455	114,155,436	6.06	41,642,141	27,180,407	559.20	80,217,972	256.49	308.77
5	Beha Construction	3,837,613	56,811,666	0.07	2,139,551	86,219,621	9.06	34,144,687	52,266,925	238.45	26,405,600	111.78	135.72
6	Bereket Endeshaw B.C.	5,924,267	153,177,546	0.04	19,076,341	169,591,358	41.06	56,421,235	97,011,858	212.28	40,782,302	87.77	165.56
7	Bright Construction PLC	5,073,548	150,074,336	0.03	1,310,231	180,453,829	2.65	52,731,259	71,425,561	269.47	61,288,427	123.97	148.15
8	FAL trading	7,330,661	299,048,182	0.02	223820.1	10,144,838	8.05	85,844,545	36,591,996	856.29	31,601,308	1136.98	-272.64
9	Flinstone Engineering	2,387,633	697,028,655	0.00	188,599,622	697,879,736	98.64	148,087,013	116,523,040	463.87	290,187,533	151.77	410.74
10	Meson Construction	1,692,887	137,545,054	0.01	7,155,007	134,116,451	19.47	24,774,389	54,481,562	165.98	87,072,733	236.97	-51.52
11	NKH Construction PLC	15,895,150	358,240,662	0.04	27,772,460	870,581,730	11.64	38,105,955	63,373,674	219.47	105,076,513	44.05	187.06
12	Orbit Engineering Construction PLC	3,365,425	329,243,492	0.01	20,124,613	224,664,138	32.70	63,642,877	95,034,652	244.43	60,955,694	99.03	178.10
13	Rama Construction PLC	10,062,851	164,810,820	0.06	80,062,742	1,362,558,464	21.45	473,923,251	1,003,668,316	172.35	585,848,524	156.94	36.86
14	Unity Engineering PLC	3,870,149	17,533,977	0.22	1276773	196,379,710	2.37	18,762,840	168,386,181	40.67	31,019,138	57.65	-14.61
15	Yotek Construction PLC	28,139,961	865,814,911	0.03	85,535,540	1,080,800,104	28.89	247,571,966	431,130,480	209.60	259,473,971	87.63	150.86
16	Zamra Construction PLC	52,185,129	1,053,123,322	0.05	94,652,326	777,327,779	44.44	318,119,923	345,114,959	336.45	434,529,426	204.04	176.86
17	Zequala Construction	4,136,687	77,598,651	0.05		84,079,602		31382761.29	62,387,576	183.61	13067899.4	56.73	126.88

FOR THE YEAR ENDED JUNE 2018/SENE 2010

S. No	FIRM	NET	TOTAL	ROA	INVENTORIES	COGS	INV. COV	RECEIVABLES	SALES	ACP	PAYABLES	APP	CCC
		PROFIT	ASSETS										
1	3M Engineering & Construction PLC	-446367.38	379302819.60	0.00	9448055.60	262188855.20	13.15	216832083.18	114721493.18	689.88	162546628.03	226.29	476.74
2	Adam Construction PLC	20246159.14	237465634.80	0.09		146097454.60	0.00	72974054.50	61812522.51	430.91	77410990.49	193.40	237.51
3	Afro-Tsion Construction PLC	55469693.34	1913919847.20	0.03	42482879.90	1668525811.80	9.29	545001495.54	581993458.15	341.80	579405823.41	126.75	224.35
4	AMB Construction	4911538.31	151472692.00	0.03	619323.90	117923187.60	1.92	40608348.86	13351027.47	1110.18	81884721.94	253.45	858.64
5	Beha Construction	4170910.70	58220151.80	0.07	1088370.82	88913489.80	4.47	31934566.93	44366459.32	262.72	25396526.93	104.26	162.94
6	Bereket Endeshaw B.C.	6708862.62	171110300.80	0.04	18633941.59	191301927.60	35.55	62963757.75	104153035.24	220.65	44290869.79	84.51	171.70
7	Bright Construction PLC	5754248.89	169988581.40	0.03	1448961.90	204562350.20	2.59	58511039.11	75913510.90	281.33	67560413.62	120.55	163.36
8	FAL trading	8148860.36	338321446.80	0.02	212634.15	10230943.60	7.59	94332038.29	40301664.22	854.34	33081197.67	1180.21	318.28
9	Flinstone Engineering	2109778.41	773386483.80	0.00	201784402.1	773258887.20	95.25	158121397.14	85527966.36	674.80	297459193.49	140.41	629.64
10	Meson Construction	1867214.64	154402380.00	0.01	7794914.33	151652232.80	18.76	26181143.79	56757169.24	168.37	96173668.94	231.47	-44.34
11	NKH Construction PLC	17427766.11	402011556.80	0.04	26019180.27	982734640.80	9.66	41609019.46	54822206.17	277.03	113804518.97	42.27	244.42
12	Orbit Engineering Construction PLC	3536627.33	370898863.80	0.01	22134900.33	248892958.00	32.46	64943379.54	93328776.78	253.99	59982741.14	87.96	198.48
13	Rama Construction PLC	10771950.88	185164062.40	0.06	88584085.34	1539303346.80	21.01	514209964.82	1103791306.74	170.04	639149679.81	151.56	39.49
14	Unity Engineering PLC	4328962.62	18556108.40	0.23	1293076	222108746.20	2.12	19797494.07	187014973.27	38.64	33759709.39	55.48	-14.71
15	Yotek Construction PLC	31180005.39	953533058.80	0.03	87193878.17	1206733466.60	26.37	261740867.50	432534968.36	220.87	250618206.50	75.80	171.44
16	Zamra Construction PLC	58235839.20	1176231036.00	0.05	101885369.5	868866745.20	42.80	337063187.50	356207336.00	345.38	455372707.91	191.30	196.89
17	Zequala Construction	4537971.84	84371363.20	0.05		88943764.00	0.00	33086671.82	61892601.34	195.12	11487478.16	47.14	147.98

APPENDIX 1B: DATA COLLECTION FOR THE CONTROL VARIABLES

The control variables relevant for the research are the Natural Logarithm of Sales (Ln sales), the Fixed Asset Ratio and the Debt Ratio. The Natural Logarithm of Sales is calculated as is stated: the natural logarithm of the firm's sales (Ln sales). The Fixed Asset Ratio is calculated through fixed assets divided by the total assets (Deloof, 2003; Lazaridis and Tryfonidis, 2006). The Debt Ratio is calculated through the total debt divided by the total assets (Lazaridis and Tryfonidis, 2006).

FOR THE YEAR ENDED JUNE 2013/SENE 2005

S. No.	FIRM	Sales	Ln(Sales)	Fixed Assets	TOTAL ASSETS	Fixed Asset Ratio	Total Debt	Debt ratio
1	3M Engineering & Construction PLC	156,555,767	18.87	38,568,650	148,266,299	0.2601	74,660,181	0.50
2	Adam Construction PLC	157,328,856	18.87	13,643,027	138,327,965	0.0986	87,384,312	0.63
3	Afro-Tsion Construction PLC	738,528,072	20.42	76,392,355	955,113,772	0.0800	661,004,101	0.69
4	AMB Construction	119,482,484	18.60	29,068,138	98,352,327	0.2956	90,190,330	0.92
5	Beha Construction	67541171.42	18.03	6592985	60520536	0.108937981	24539906.72	0.41
6	Bereket Endeshaw B.C.	68771604	18.05	28773057	46525889	0.618431106	69514027.52	1.49
7	Bright Construction PLC	102308991	18.44	8568936	100236401	0.085487267	14076440	0.14
8	FAL Construction	8588984.45	15.97	19702934	142540314.4	0.138227098	11857664	0.08
9	Flinstone Engineering	481895335	19.99	72433931	371554171	0.194948507	438153610.7	1.18
10	NKH Construction PLC	136858666	18.73	42586980	177841771	0.239465564	25368000	0.14
11	Mescon Construction	59594083	17.90	20092676	90206862	0.222739995	52169600	0.58
12	Orbit Engineering Construction PLC	136589365	18.73	105853504.9	191495268.3	0.552773475	90586214.88	0.47
13	Rama Construction PLC	738343595.2	20.42	9149896	85789461.64	0.106655244	433125483.1	5.05
14	Unity Engineering PLC	102836931	18.45	81099982	12996161	6.240302963	25354941.92	1.95
15	Yotek Construction PLC	606239037	20.22	75543329	514861170	0.146725629	348907057	0.68
16	Zamra Construction PLC	623,263,447	20.25	96,582,360	629,921,752	0.1533	567,945,072	0.90
17	Zequala Construction	95967215	18.38	16258300	38615729	0.421027918	23624987.68	0.61

FOR THE YEAR ENDED JUNE 2014/SENE 2006

S. No.	FIRM	Sales	Ln(Sales)	Fixed Assets	TOTAL ASSETS	Fixed Asset Ratio	Total Debt	Debt ratio
1	3M Engineering & Construction PLC	159,072,215	18.88	5,847,735	229,166,752	0.0255	195,420,264	0.85
2	Adam Construction PLC	84,238,838	18.25	11,122,680	120,333,429	0.0924	57,959,504	0.48
3	Afro-Tsion Construction PLC	1,222,247,031	20.92	108,797,119	1,060,677,715	0.1026	961,068,641	0.91
4	AMB Construction	130,373,329	18.69	28,947,501	126,412,960	0.2290	111,123,067	0.88
5	Beha Construction	97941078	18.40	6383068	68283003	0.093479603	52667343	0.77
6	Bereket Endeshaw B.C.	142014563.1	18.77	35680000	75794133.33	0.470748835	49266186.66	0.65
7	Bright Construction	2375676.55	14.68	62580360	173899183.6	0.359865749	113034469.3	0.65
8	FAL Construction	461275	13.04	19029365	428035381	0.044457458	18218354	0.04
9	Flinstone Engineering	156859000	18.87	81450756	202420859	0.402383215	407224050	2.01
10	Meson Construction	38812454.98	17.47	22156890	104785865	0.211449226	68110812.25	0.65
11	NKH Construction PLC	123568958	18.63	46580000	212428515.9	0.219273763	138078535.3	0.65
12	Orbit Engineering Construction PLC	100966652	18.43	32100000	75220172.46	0.426747227	48893112.1	0.65
13	Rama Construction PLC	954989552.4	20.68	144956657.2	107037990.1	1.354254289	520493965.3	4.86
14	Unity Engineering PLC	121594105	18.62	8321023	15084960	0.551610545	32464098	2.15
15	Yotek Construction PLC	814248144	20.52	127707848	636318710	0.20069793	344016044	0.54
16	Zamra Construction PLC	40,607,162	17.52	79,597,660	573,132,404	0.1389	359,838,440	0.63
17	Zequala Construction	64025780	17.974796	1529616	69404111	0.022039271	34987600	0.50

FOR THE YEAR ENDED JUNE 2015/SENE 2007

S. No.	FIRM	Sales	Ln(Sales)	Fixed Assets	TOTAL ASSETS	Fixed Asset Ratio	Total Debt	Debt ratio
1	3M Engineering & Construction PLC	117,910,790	18.59	38,568,650.00	251,215,927	0.15	184,557,681.30	0.73
2	Adam Construction PLC	62,744,663	17.95	13,643,027.00	166,597,900	0.08	88,403,801.50	0.53
3	Afro-Tsion Construction PLC	248,648,869	19.33	76,392,355.00	1,312,291,259	0.06	1,034,063,258.00	0.79
4	AMB Construction	121,469,607	18.62	29,897,343.40	124,122,469	0.24	124,279,953.00	1.00
5	Beha Construction	55,337,230	17.83	6,592,985.00	53,994,694	0.12	51,891,651.90	0.96
6	Bereket Endeshaw B.C.	74,349,763	18.12	28,773,057.00	117,312,036	0.25	80,827,895.09	0.69
7	Bright Construction	89,862,403	18.31	8,568,936.00	110,245,845	0.08	90,921,745.24	0.82
8	FAL Construction	32,299,627	17.29	19,298,792.60	220,501,651	0.09	15,935,727.80	0.07
9	Flinstone Engineering	156,786,370	18.87	72,433,931.00	544,312,996	0.13	442,492,364.80	0.81
10	Mescon Construction	43,771,854	17.59	20,092,676	103,830,400	0.19	68,448,243.90	0.66
11	NKH Construction PLC	132,732,777	18.70	59582790	270,698,872	0.22	111,637,570.02	0.41
12	Orbit Engineering Construction PLC	100,324,889	18.42	105,853,504.90	245,932,748	0.43	73,271,736.01	0.30
13	Rama Construction PLC	942,363,500	20.66	9,149,896.00	124,104,336	0.07	607,145,985.00	4.89
14	Unity Engineering PLC	260,380,250	19.38	81,099,982.00	15,549,715	5.22	39,671,815.95	2.55
15	Yotek Construction PLC	242,715,525	19.31	75,543,329.00	690,378,615	0.11	362,255,114.90	0.52
16	Zamra Construction PLC	165,262,500	18.92	96,582,360.00	806,907,894	0.12	526,991,599.70	0.65
17	Zequala Construction	99,157,500	18.41	16,258,300.00	64,053,228	0.25	28,953,447.80	0.45

FOR THE YEAR ENDED JUNE 2016/SENE 2008

S. No.	FIRM	Sales	Ln(Sales)	Fixed Assets	TOTAL ASSETS	Fixed Asset Ratio	Total Debt	Debt ratio
1	3M Engineering & Construction PLC	44540220.20	17.61	30333615.33	293911558.00	0.10	217337264.00	0.74
2	Adam Construction PLC	23586874.64	16.98	14062112.27	190220478.00	0.07	97988751.00	0.52
3	Afro-Tsion Construction PLC	342229168.68	19.65	108399241.27	1512834121.80	0.07	1179879349.00	0.78
4	AMB Construction	36504532.12	17.41	30342834.60	133239207.20	0.23	139143753.00	1.04
5	Beha Construction	47423501.84	17.67	7788197.87	55403179.80	0.14	60505307.00	1.09
6	Bereket Endeshaw B.C.	39764077.67	17.50	42223915.13	135244791.20	0.31	75794133.33	0.56
7	Bright Construction	46665189.43	17.66	33947726.80	130160090.60	0.26	109581000.50	0.84
8	FAL Construction	55129157.00	17.83	19298792.60	259774916.40	0.07	428035381.00	1.65
9	Flinstone Engineering	43920520.00	17.60	99519259.33	620670825.40	0.16	465567903.00	0.75
10	Mescon Construction	10867487.39	16.20	29434426.27	120687726.80	0.24	77543504.00	0.64
11	NKH Construction PLC	34599308.24	17.36	68991288.00	314469766.60	0.22	129449183.00	0.41
12	Orbit Engineering Construction PLC	28270662.56	17.16	109319907.71	287588119.80	0.38	75677387.66	0.26
13	Rama Construction PLC	567397074.67	20.16	36924447.49	144457578.40	0.26	693567423.00	4.80
14	Unity Engineering PLC	34046349.40	17.34	76774278.87	16551846.20	4.64	46591670.00	2.81
15	Yotek Construction PLC	227989480.32	19.24	104927951.73	778096763.20	0.13	379017112.00	0.49
16	Zamra Construction PLC	451370005.36	19.93	119139001.60	930015608.00	0.13	571046540.00	0.61
17	Zequala Construction	17927218.40	16.70	13543610.80	70825939.60	0.19	29671598.00	0.42

FOR THE YEAR ENDED JUNE 2017/SENE 2009

S. No.	FIRM	Sales	Ln(Sales)	Fixed Assets	TOTAL ASSETS	Fixed Asset Ratio	Total Debt	Debt ratio
1	3M Engineering & Construction PLC	113,512,218	18.55	31,188,303.73	336,607,189	0.09	250,116,846.70	0.74
2	Adam Construction PLC	64,746,368	17.99	14,638,600.15	213,843,056	0.07	107,573,700.90	0.50
3	Afro-Tsion Construction PLC	582,118,185	20.18	119,826,387.87	1,713,376,985	0.07	1,325,695,439.00	0.77
4	AMB Construction	27,180,407	17.12	30,788,325.80	142,355,950	0.22	154,007,551.80	1.08
5	Beha Construction	52,266,925	17.77	8,435,638.78	56,811,666	0.15	69,118,961.42	1.22
6	Bereket Endeshaw B.C.	97,011,858	18.39	48,723,822.81	153,177,546	0.32	97,056,607.63	0.63
7	Bright Construction	71,425,561	18.08	38,784,233.60	150,074,336	0.26	128,240,255.76	0.85
8	FAL Construction	36,591,996	17.42	19,298,792.00	299,048,182	0.06	252,647,690.51	0.84
9	Flinstone Engineering	116,523,040	18.57	112,769,387.62	697,028,655	0.16	488,643,442.00	0.70
10	Mescon Construction	54,481,562	17.81	32,245,260	137,545,054	0.23	86,638,765.02	0.63
11	NKH Construction PLC	63,373,674	17.96	78399786	358,240,662	0.22	147,260,796.62	0.41
12	Orbit Engineering Construction PLC	95,034,652	18.37	126,970,275.35	329,243,492	0.39	78,083,039.00	0.24
13	Rama Construction PLC	1,003,668,316	20.73	25,150,667.27	164,810,820	0.15	779,988,859.39	4.73
14	Unity Engineering PLC	168,386,181	18.94	89,382,485.92	17,533,977	5.10	53,511,524.53	3.05
15	Yotek Construction PLC	431,130,480	19.88	112,875,077.99	865,814,911	0.13	395,779,108.64	0.46
16	Zamra Construction PLC	345,114,959	19.66	134,012,351.91	1,053,123,322	0.13	615,101,480.30	0.58
17	Zequala Construction	62,387,576	17.95	14,569,533.60	77,598,651	0.19	30,389,747.70	0.39

FOR THE YEAR ENDED JUNE 2018/SENE 2010

S. No.	FIRM	Sales	Ln(Sales)	Fixed Assets	TOTAL ASSETS	Fixed Asset Ratio	Total Debt	Debt ratio
1	3M Engineering & Construction PLC	114721493.18	18.56	32,042,991.93	379,302,820	0.08	282,896,429.40	0.75
2	Adam Construction PLC	61812522.51	17.94	15,215,088.04	237,465,635	0.06	117,158,650.60	0.49
3	Afro-Tsion Construction PLC	581993458.15	20.18	131,253,534.47	1,913,919,847	0.07	1,471,511,530.40	0.77
4	AMB Construction	13351027.47	16.41	31,233,817.00	151,472,692	0.21	168,871,351.00	1.11
5	Beha Construction	44366459.32	17.61	9,083,079.70	58,220,152	0.16	77,732,616.18	1.34
6	Bereket Endeshaw B.C.	104153035.24	18.46	55,223,730.50	171,110,301	0.32	108,457,993.41	0.63
7	Bright Construction	75913510.90	18.15	43,620,740.40	169,988,581	0.26	146,899,511.02	0.86
8	FAL Construction	40301664.22	17.51	19,298,792.60	338,321,447	0.06	297,567,753.92	0.88
9	Flinstone Engineering	85527966.36	18.26	126,019,515.90	773,386,484	0.16	511,718,980.76	0.66
10	Mescon Construction	56757169.24	17.85	35,056,093	154,402,380	0.23	95,734,025.55	0.62
11	NKH Construction PLC	54822206.17	17.82	87808284	402,011,557	0.22	165,072,409.92	0.41
12	Orbit Engineering Construction PLC	93328776.78	18.35	144,620,642.99	370,898,864	0.39	80,488,690.96	0.22
13	Rama Construction PLC	1103791306.74	20.82	13,376,887.06	185,164,062	0.07	866,410,296.26	4.68
14	Unity Engineering PLC	187014973.27	19.05	101,990,692.98	18,556,108	5.50	60,431,378.82	3.26
15	Yotek Construction PLC	432534968.36	19.89	120,822,204.25	953,533,059	0.13	412,541,105.50	0.43
16	Zamra Construction PLC	356207336.00	19.69	148,855,702.23	1,176,231,036	0.13	659,156,420.60	0.56
17	Zequala Construction	61892601.34	17.94	15,595,496.40	84,371,363	0.18	31,107,897.64	0.37

LIST OF CONSTRUCTION FIRMS FOR YEAR FROM Hamle 01-2009 UP TO Tir 24-2010

Order No.	organization Name	Serial No	Category	Town	wereda	Date of registration
1	Berhan Tobiaw Mareye	999	BC-1	A/A	9	16/1/2010
2	Universal Construction P.L.C.	6718	BC-1	A/A	4	24/5/2010
3	Nasew Construction P.L.C.	5144	GC-1	A/A	7	25/12/2009
4	Desalegn Asreda Building Contractor	3464	BC-1	A/A	8	12/4/2010
5	Pyramid Construction & Trading PLC	0	GC-1	A/A	-	25/12/2009
6	3M Engineering & Con.PLC	9231	BC-1	A/A	4	1/2/2010
7	Macro General Contractor & Trading PLC	7400	GC-1	A/A	15	25/11/2009
8	Sunshine Construction PLC	1682	GC-1	A/A	1	7/2/2010
9	Orbit Engineering & Construction P.L.C.	3312	BC-1	A/A	13	7/2/2010
10	Santa Maria Construction PLC	5938	GC-1	A/A	5	3/5/2010
11	Kassa & Sons Construction P.L.C.	5943	BC-1	A/A	11	21/5/2010
12	Samuel S/Mariam Endale	4107	BC-1	A/A	4	6/4/2010
13	Gashaw Melese Building Contractor	1566	BC-1	A/A	9	8/1/2010
14	Afro-Tsion Construction PLC	2520	GC-1	A/A	4	24/2/2010
15	Mesay Oli Atomsa	5455	BC-1	A/A	4	26/4/2010
16	Tayam Engineering & Commerce P.L.C	658	BC-1	A/A	10	14/2/2010
17	Teklehaimanot Asgedom	3473	BC-1	A/A	8	5/4/2009
18	Addis Gelaw Building Contractor	10564	BC-1	A/A	5	1/5/2010
19	Yousef Kassaye Building Contractor	3545	BC-1	A/A	5	28/3/2010
20	Bright Construction PLC	6682	BC-1	A/A	3	11/12/2009
21	Zamra Construction PLC	4654	GC-1	A/A	13	9/4/2010
22	Getachew Atsbeha Kidanu	3421	BC-1	A/A	4	9/1/2010
23	Koracon Construction	3313	BC-1	A/A	-	5/4/2010
24	Fufa Legissa Building Contractor	9272	BC-1	A/A	19	2/2/2010
25	Giga Construction PLC	3092	GC-1	A/A	7	19/3/2010
26	Dawit Wondimu Besha	8964	BC-1	A/A	3	11/1/2010
27	Workneh Guday Teshale	5358	BC-1	A/A	6	22/3/2010
28	Geom Luigi Varnero PLC	1477	GC-1	A/A	7	18/4/2010
29	Homa Construction PLC	5117	GC-1	A/A	4	4/5/2010
30	SATCON Construction PLC	4245	GC-1	A/A	5	20/2/2010
31	Yotek Construction PLC	491	GC-1	A/A	6	24/1/2010
32	Bereka Construction	10065	BC-1	A/A	2	3/4/2010
33	Trust Construction	5664	BC-1	A/A	3	10/4/2010
34	SUR Construction PLC	3291	GC-1	A/A	2	18/5/2010
35	Grace Engineering	2557	BC-1	A/A	14	17/4/2010
36	Tekleberhan Ambaye Construction PLC	3636	GC-1	A/A	13	23/4/2010
37	N.K.H. Construction P.L.C.	592	GC-1	A/A	12	4/12/2009
38	Unity Engineering PLC	3781	BC-1	A/A	14/15	6/4/2010
39	M C G Construction PLC	7388	BC-1	A/A	3	13/4/2010
40	Alliance Construction	4640	BC-1	A/A	12	27/11/2009
41	Gift Construction PLC	8738	BC-1	A/A	02	24/12/2009
42	Adam Construction PLC	5298	BC-1	A/A	03	08/05/2010
43	Asmelash & Sons Construction PLC	2713	BC-1	A/A	3	22/5/2010

44	Buelkon Construction PLC	10673	BC-1	A/A	4	8/5/2010
45	Yencomad Construction PLC	4521	GC-1	A/A	9	24/5/2010
46	Birhanu Ashebir Construction PLC	7198	BC-1	A/A	8	15/1/2010
47	Aseph Engineering	4985	BC-1	A/A	5	2/5/2010
48	Dugda Construction	8581	SC-1	A/A	1	12/12/2009
48	T L Trading PLC	9616	PF-1	A/A	5	22/2/2010
50	Arcon Design Building PLC	10335	BC-1	A/A	8	18/4/2010
51	Birhanu Abebe Building Contractor	10352	BC-1	A/A	6	17/4/2010
52	IFH Engineering PLC	8066	GC-1	A/A	5	19/1/2010
53	Dawit Emiru Building Contractor	7261	BC-1	A/A	4	9/12/2009
54	Mulu Hadgu Construction	2415	BC-1	A/A	13	12/4/2010
55	Capstone Engineering	1861	BC-1	A/A	1	11/12/2009
56	SA Construction PLC	1999	BC-1	A/A	2	20/4/2010
57	Powercon P.L.C.	7230	GC-1	A/A	3	24/2/2010
58	SALINI IMPREGILO S.P.A ETHIOPIAN BRANCH	8111	GC-1	A/A	8	27/4/2010
59	Afework Gidey Berhe	6334	GC-1	A/A	13	11/1/2010
60	Bamacon Engineering PLC	792	BC-1	Addis Abeba	2	18/1/2009
61	Ethio Canadian Business Group PLC	4752	GC-1	A/A	3	17/4/2010
62	FAL General Contractor	3612	GC-1	A/A	8	16/5/2010
63	Two Y Engineering	3282	BC-1	A/A	4	30/1/2010
64	LUCI ENGINEERING P.L.C.	1001	BC-1	A/A	9	15/1/2010
65	Seyfe Wondie Adenew	10574	BC-1	A/A	10	1/5/2010
66	Jofor Construction & Real State	9747	BC-1	A/A	3	27/3/2010
67	TNT Construction & Trading	1255	GC-1	A/A	8	21/11/2009
68	Bekele Sorsa Joli	2584	BC-1	A/A	3	1/5/2010
69	Justice Building Contractor PC	5587	BC-1	A/A	07	1/5/2010
70	Aynalem Gashaw Argie	2727	BC-1	A/A	4	25/4/2010
71	Mohamed Yesuf Construction	3148	BC-1	A/A	10	4/5/2010
72	Mohammed Abas Bilae	2469	BC-1	A/A	13	4/5/2010
73	Yohannes Haile Building Contractor	3393	BC-1	A/A	1	11/4/2010
74	Ashtho Engineering PLC	8566	BC-1	A/A	7	11/12/2009
75	Solomon Tilahun Building Contractor	3103	BC-1	A/A	17/18	19/4/2010
76	B Four Family Trading PLC	9331	BC-1	A/A	1	7/2/2010
77	Beha Construction	5080	BC-1	A/A	-	21/2/2010
78	Etete Construction	1693	BC-1	A/A	3	5/4/2010
79	Tesfaye Tsegaye Building Contractor	269	BC-1	Addis Ababa	8	5/4/2010
80	K.K.G Construction	3968	BC-1	A/A	3	7/5/2010
81	Megelta Construction P.L.C.	3611	BC-1	A/A	8	9/12/2009
82	Tilahun Abebe G/Mariam	2970	GC-1	A/A	2	15/3/2010
83	Loza Construction PLC	7422	BC-1	A/A	5	3/5/2010
84	Sina Construction PLC	3444	GC-1	A/A	2	25/4/2010
85	Samkete Engineering & Construction PLC	4041	BC-1	A/A	13	23/4/2010
86	B.G.M. Construction	3248	BC-1	A/A	2	1/12/2009
87	Biruk Beser Achew	3178	BC-1	A/A	2	10/1/2010
88	TIKS Construction	10431	GC-1	A/A	-	19/4/2010
89	Bencon Construction	10361	BC-1	A/A	2	17/4/2010
90	Mudcon Construction PLC	9580	GC-1	A/A	7	22/2/2010

91	Dugda Construction PLC	5312	BC-1	A/A	1	5/12/2009
92	Nahiet Business PLC	6870	BC-1	A/A	11	3/5/2010
93	Serja Construction And General Trade PLC	10331	BC-1	A/A	1	16/4/2010
94	Yared Esayas Micheal	7724	BC-1	A/A	6	16/4/2010
95	Bokra Construction & Trading PLC	10840	BC-1	A/A	06	22/05/2010
96	Beaeka General Business PLC	6917	GC-1	A/A	7	22/5/2010
97	Aser Construction PLC	3852	GC-1	A/A	-	11/4/2010
98	Mikada Engineering & Trading PLC	4759	GC-1	A/A	03	07/05/2010
99	Berehane Adane Construction	4350	BC-1	A/A	4	18/4/2010
100	XUEKAI YU	7041	GC-1	A/A	4	9/5/2010
101	YOT Construction PLC	9869	BC-1	Addis Ababa	4	19/3/2010
102	Tesfaye Legesse Construction	9060	RC-1	A/A	4	19/1/2010
103	Webcon Construction PLC	5911	BC-1	A/A	14	12/1/2010
104	Kibco Service& Investment PLC	8643	BC-1	A/A	03	17/12/2009
105	Felema Construction PLC	398	BC-1	A/A	07	10/12/2009
106	Markan Trading PLC	7240	GC-1	A/A	1	24/4/2010
107	Ethiopian Construction Works Corporation	1788	GC-1	A/A	9	2/4/2010
108	Equator Engineering Construction PLC	5263	BC-1	A/A	6	24/2/2010
109	Kibru Fitret Melaw	5549	BC-1	A/A	04	14/5/2010
110	Ovid Construction PLC	8963	BC-1	A/A	2	11/1/2010