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“THE IMPACT OF WORKING CAPITAL MANAGEMENT ON PROFITABILITY OF CONSTRUCTION FIRMS IN ETHIOPIA: THE CASE OF CATEGORY A CONSTRUCTION COMPANIES “

BY

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“THE IMPACT OF WORKING CAPITAL MANAGEMENT ON PROFITABILITY OF CONSTRUCTION FIRMS IN ETHIOPIA: THE CASE OF CATEGORY A CONSTRUCTION COMPANIES “

A thesis is submitted to Addis Ababa University, college of Business and Economics, Department of Accounting and Finance in partial fulfilment of the requirement for the degree in Masters of Business Administration in finance

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This is to certify that Beemnet Kumlachew has carried out her research work on the topic entitled " The Impact of working capital management on profitability of construction firms in Ethiopia – the case of category A construction companies ". The work is original in nature and is suitable for submission for the award of the Degree of Master of Business Administration in Finance at the Addis Ababa University.

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The Impact of Working Capital Management on Profitability of Construction firms in Ethiopia- the Case of category A Construction Companies

Approved by Examining Board:

Examiner:

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Name	Signature	Date

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Abstract

The purpose of this study is to examine the impact of working capital management on profitability of construction firms in the case of category A Construction companies. In light of this object the study adopted quantitative approaches to test a series of research hypothesis. Financial statement of a sample of seventeen (17) construction companies is used for a period of eight years (2008-2015) with the total of 136 observations. Data was analyzed on quantitative basis using descriptive and regression analysis (ordinary least square) method. Proportionate random stratified sample was used. It examined the components in working capital such as accounts receivable period, inventory holding period, account payable period, and cash conversion cycle in relation to return on assets (ROA). In addition the study used current ratio and quick ratio, used as liquidity indicator; firm size , as measured by logarithms of sales ; sales growth rate as measured by change in annual sales, as control variables. The key findings from the study are: firstly, there exists a significant negative relationship between average collection period and profitability indicating that an increase in the number of days a firm receives payment from sales affects the profitability of the firm negatively; secondly, there exists a negative relationship between inventory holding period with profitability and positive relationship between accounts payable period and profitability. But, both inventory holding period and accounts payable period was found to be insignificant in affecting profitability of the firms. Thirdly, there exists a negative relationship between cash conversion cycle and profitability of the firm. Which indicates that as the cash conversion cycle decreases it leads to an increase in profitability of the firm, and managers can increase profitability of their firms by shortening the time lag between a firm's expenditure for purchases of raw materials and the collection of sales of finished goods. In general the study recommended that firms should minimize working capital management components in order to maximize profitability.

Key terms: liquidity, working capital management, profitability and construction firms.

List of Acronyms

APP:	Account Payable Period
ARP:	Account Receivable Period
CCC:	Cash Conversion cycle
CR:	Current Ratio
ERCA:	Ethiopia Revenue and Customs Authority
FS:	Firm Size
GDP:	Growth Domestic Product
HCC:	Hindustan Construction Company
HCL:	Hindustan Construction Limited Company
IHP:	Inventory Holding Period
NWC:	Negative Working Capital
OLS:	Ordinary Least Square
PLC:	Private Limited Company
QR:	Quick Ratio
ROE:	Return on Equity
SG:	Sales Growth
SIL:	Simplex Infrastructure Limited Company
WCM:	Working Capital Management
WCP:	Working Capital Policy

Table Content

Chapter One

1. Introduction

1.1. Background of the study

Construction companies are currently experiencing liquidity crunch due to tightening funding norms being employed by institutional financers. The profit margins of the companies are squeezing due to increasing commodity prices. The sector is faced with high operation, maintenance, and financial costs. Recent trends show that this is primarily due to increase in international prices and are thus unlikely to go down in the near future. When a company is going through liquidity crisis, the best things it can do is to revisit its working capital management practices and examine where further improvements are possible.

Working capital refers to firm's investment in short-term assets, cash, short-term securities, accounts receivable (debtors) and inventories. This is called gross working capital. But the most popular concept of working capital is net working capital which is the difference between current assets and current liabilities. Current liabilities are those claims of outsiders, which are expected to mature for payment within an accounting year and include creditor's dues, bills payable, bank overdraft and outstanding expenses. It also deals with current assets and current liabilities. Current asset is cash and other assets are expected to be converted in to cash in the ordinary course of business within one year or within such longer period as constitutes the normal operating cycle of a business. Working capital is a critical component in the functioning of any business and understanding of working capital is, therefore, crucial to analyze the financial position of construction companies (Fitzgerald, 2006).

Net working capital can be positive or negative. Excessive levels of current assets can easily result in a firm's realizing a substandard return on investment. However firms with too few current assets may face shortages and difficulties in maintaining smooth operations (Horne and Wachowicz, 2000). Efficient working capital management involves planning and controlling current assets and current liabilities in a manner that eliminates the risk of inability to meet due short term obligations on the one hand and avoid excessive investment in these assets on the other hand (Eljelly, 2004).

Working capital is a very important part of corporate finance because it directly affects company's liquidity and profitability (Deloof, 2003). Therefore, there must be a tradeoff between these objective (- of liquidity and profitability-). One objective should not be at the cost of the other since both have their own contribution. If firms do not care about profit, they could not survive for a long time. If firms do not care about liquidity they may face the problem of insolvency or bankruptcy (Nguyen, 2013).

Some researchers (Wajahat and Syed (2010), and Vishnanis and Shah B (2007) pointed out that working capital is just an idle resource with a high cost and low benefit associated with it. So they advised companies to follow zero working capital policy. Another scholar Stephen (2000) explained that net working capital is usually positive in a healthy firm. Excessive levels of current assets may have a negative effect on the firm's profitability whereas a low level of current assets may lead to lower level of liquidity and stock outs- resulting in difficulties in maintaining smooth operations (Van and Wachowicz, 2004). Traditional concept of working capital is the different between assets and current liabilities. Thus - working capital management is an attempt to manage and control the current assets and the current liabilities in order to maximize profitability and proper level of liquidity in business (Wobshet, 2013).

This includes ensuring the optimum balance of working capital components receivables, inventory and payables and using the cash efficiently for day-to-day operations. Optimization of working capital balance can be achieved by minimizing the working capital requirements and realizing maximum possible revenues. If working capital is efficiently managed, it will increase firms' free cash flow, which in turn increases the firms' growth opportunities and return to shareholders.

The WCM of a business enterprise in part affects its profitability. The ultimate objective of any business enterprise is to maximize the profit. But, preserving liquidity of the business enterprise is an important objective too (Niman, 2015). The problem is that increasing profits at the cost of liquidity can bring serious problems to the firm. For these reasons- WCM should be given proper consideration and will ultimately affect the profitability of the business enterprise. Therefore: - it is a critical issue to know and understand the impacts of working capital management and its influence on firm's profitability.

A contractor needs enough cash to pay wages and salaries as they fall due and to pay creditors if it is to keep its workforce and ensure its supplies. Maintaining adequate working capital; is not only important in the short term. Sufficient liquidity must be preserved in order to insure 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 (Vinay k., 2015).

Therefore, when a business makes an investment decision they must not only consider the financial outlay involved with acquiring the new machine or the new building but must also take account of the additional current assets that are usually involved with any expansion of activity. In working capital analysis, the direction of change over a period of time is of crucial importance. Not only that, analysis of working capital trends provides a base to judge whether the practice and prevailing policy of the management with regard to working capital is good enough or an improvement is to be made in managing the working capital funds.

However, in the context of Ethiopia, to the knowledge of the researcher, there is a lot of study taken in working capital management and firm's profitability in the case of Manufacturing, Textile and small and medium enterprise but there is no study undertaken about working capital management and profitability in the case of construction companies. Therefore- the aim of the study was to study the impact of working capital management on profitability of construction industry by selecting category "A" contractor in Ethiopia.

The ultimate question that calls to mind at this juncture is "How does working capital management impact the profitability of category "A" construction companies in Ethiopia?" This study is therefore designed to analyze the impact of working capital management on profitability of construction companies in Ethiopia between 2008 and 2015.

1.2. Statement of the problem

Every firm is required to maintain a balance between profitability and liquidity during conducting its day to day operations. As inadequate amount of working capital impairs a firm liquidity, holding of excess working capital results in the reduction of the profitability. (Henok, 2015). Working capital management plays an important role in any companies because without working capital management, firms operation will not run smoothly (Diep, 2013).

Working capital management have a significant impact upon both the liquidity and profitability (Shin and Soenen, 1998; Dong and Su, 2010). Therefore, the crucial part of managing working capital is maintaining the required liquidity in day – to day operation to ensure firms running and to meet its obligation (Eljelly, 2004).

As a result, in order to explain the relationship between working capital management and profitability of construction firms, many researchers in different countries have carried out a study. Several research studies have been done in relation to working capital management in Ethiopia. Ephrem (2011) studied the impact of working capital management on the profitability of small and medium enterprise; Henok, 2015; Wobshet, 2014; Moftah, 2016; and Niman, 2015: did a survey of the impact of working capital management on the profitability of manufacturing firms in Ethiopia.

However, this issue on construction sector has not attracted to researchers in Ethiopia. Therefore, the researcher believed that the problem is almost untouched and there is a knowledge gap on the area. Hence, lack of proper research on the area gives a chance for the Ethiopia construction company's managers to have limited awareness in relation working capital management with increasing firm's profitability.

Therefore, the study try to find out the impact of working capital management on firm's profitability on construction firms in Ethiopia.

1.3. Objectives

The general and specific objectives of the study are set below.

1.3.1 General Objective

The general objective of this study is to examine the impact of working capital management on profitability of construction companies in Ethiopia.

1.3.2 Specific Objective

The specific objective of this study are:-

- Analyses the effect of account receivable period on construction firms profitability
- Evaluate the effect of inventory holding period on construction firms profitability
- Ascertain the relationship between average payment period and profitability of construction the firm.
- Examine the relationship between cash conversion cycle and profitability of construction the firm.

1.4 Research hypotheses

The following hypothesis are developed based on the research objectives and previous empirical studies. Therefore, this study attempted to test the following hypothesis in the case of category A construction companies in Ethiopia.

HP1: There is a significant and negative relationship between account receivable period and construction firm's profitability.

HP2: There is a significant and negative relationship between inventory holding period and construction firm's profitability

HP3: There is a significant and positive relationship between account payable period and construction firm's profitability.

HP4: There is a significant and negative relationship between cash conversion cycle and construction firms profitability.

1.5. Scope of the study

The general aim of the study is to assess the impact of working capital management on profitability of Construction Company in Addis Ababa, Ethiopia. Therefore, the study is restricted to the construction company annual financial statements and focus on selected 17 Ethiopian construction companies financial statements for the period of 2008-2015.

The rationale behind taking eight years data (i.e started from 2008) was that because of the availability of data found from ERCA and the sample selection was done by randomly and all the sample data company are in Addis Ababa.

1.6. Significance of the study

The significance of this research includes the following:-

- As it is explained in the review of the literature part studies made so far in Ethiopia with the objective of examining the impact of working capital management on profitability in construction sector of Ethiopia are limited. As a result, this study will makes contributions towards extended research in the area of the impact of working capital management on profitability of construction firms in Ethiopia.
- It will gives evidence to the regulators and concerned party who are interested in improving working capital role for construction companies profitability?
- It will provide immense information for all stakeholders in the area about the opportunity of working capital management for the profitability of the construction sector.
- Lastly, 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.

1.7. Organization of the study

The intent of the study was to analysis the impact of working capital management on profitability of construction sector in Ethiopia. This study was organized in to five chapters. Chapter two presented literature review consists theoretical review in section one, empirical studies follow next and finally, conclusions and knowledge gap, the methodology and procedures

used to gather data for the study were presented in chapter three, the results of analyses and findings to emerge from the study would be contained in chapter four. Chapter five contained a summary of the study findings, conclusions and recommendation.

Chapter Two

2. Literature review

2.1 Introduction

The purpose of this chapter is to review the conceptual / theoretical and empirical evidence issues relating on working capital management and profitability of a firm. It is arranged into three sub-themes. The first part presents the theoretical review of working capital management and then the empirical evidence pertaining to working capital management will be addressed. Finally, on the summary of the existing literatures on working capital management and profitability of a firm with the knowledge's gap that this study attempts to address is explained.

2.2 Overview of Working Capital

Finance is the lifeblood of business organization it needs to meet the requirements of the business concern. Each and every business concern maintain adequate financial position for their smooth running of the business and also maintain the business carefully to achieve the goal of the business. (John, T. A., & John, K. 1991).

The term liquidity refers to the ability of an organization to pay its current liabilities as they come due. Not only does financial management aim at the effective utilization- but also at the proper management of a money. If sufficient funds are available at the time when needed, a company can clear its short term debts: its operations can be maintained effectively and so the working capital financing lends a hand for a business to do well (Fareed, 2014).

2.2.1 Definition and Concept of Working Capital

Working capital originated during the time of -Yankee peddler who would load up his wagon and go off to peddle his wars. The merchandise was called "working capital" because it was what he actually sold, or -"turned over"- to produce his profits (Brigham and Houston, 2015. p 521).

Working capital is defined as "the administration of the firm's current assets and financing needed to support current assets". The term working capital is used for everyday requirement of funds for any business. A business needs certain amount of cash for meeting routine payments,

providing unforeseen events or purchasing raw materials for productions. Thus, working capital refers to the excess of the current assets over the current liabilities (Fareed, 2014).

Therefore, the difference of current assets and current liabilities is called working capital and it can be mathematically calculated as

Net Working Capital = Current asset – Current liabilities…….. (Fareed, 2014).

The quantity of working capital in a firm account is a measure of the short term financing strength of a construction firms. Current assets are used to pay current liabilities, and therefore it is important to know how much current assets exceed current liabilities, which is evaluated by the amount of working capital. Working capital increases when a company makes a profit on a project, sells equipment's or other assets, or has a long term loan from a bank. A long term bank loan can increase - (short term) - assets, but at the same time increases long term liabilities. However, construction companies usually do not easily resort to selling equipment or borrowing long term loans. -Working capital decreases when a company had higher expense of money on a project, or when it purchases equipment, or makes repayments on long term loans. Construction companies are, mainly eager to purchase equipment or to pays off loans (Tang, 2015).

According to Khan and Jain (2007), - there are two basic concepts in working capital:

- Gross working capital
- Net working capital

Gross Working Capital: means that the total sum of all current assets of a business as a gross working capital. It is estimated as

Gross working capital = Stock+ Debtors + Receivables + Cash

Net Working Capital: is the difference between current assets and current liabilities of a business as a net working capital. Hence, it also estimated as

Net working capital = Stock + Debtors + Receivables + Cash – Creditors – Payables

2.2.2 Nature of Working Capital

The nature of working capital have the following characteristics,

- It is used to purchase raw materials, payment of wages and expenses.
- Working capital enhances liquidity, solvency, creditworthiness and reputation of the firms.
- It generates the element of cost namely: such as materials, wages and expense.
- It enables the firms to avail the cash discount facilities offered by its suppliers.
- It helps improve the morale of business executives and their efficiency reaches at the highest climax.
- It facilitates expansion programs of the enterprise and helps in maintaining operational efficiency of fixed assets. (Shelton , 2002 and Miftah , 2016)

2.2.3. Classification of Working Capital

Working capital classified follows:

a) Gross Working Capital

Gross working capital refers to the amount of funds invested in various components of current assets. It consists of raw materials, work in progress and finished goods.

b) Net Working Capital

Net working capital is the excess of current assets over current liabilities known as net working capital.

c) Positive working capital

Positive working capital refers to the surplus of current assets over current liabilities.

d) Negative Working capital

Negative working capital refers to the excess of current liabilities over current assets. Negative working capital (NWC) is also defined as the excess of current liabilities over current assets. While calculating the net working capital, if the figure is found negative, it is called NWC. This

situation indicates that current liabilities havefinanced100%of current assets and a portion of fixed assets (Mohan, 2015).

e) Permanent Working Capital

It is also known as **Fixed Working Capital** and refers to a minimum amount of investment in all working capital which is required at all times to carry out minimum level of a business activities (Brigham and Houston, 2003). The minimum amount of working capital is essential during the dullest season of the year is known as **Permanent Working Capital**. The 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 p. 679).

Kumar (1999) suggests that permanent working capital should be obtained with the help of long-term sources of finance while variable/ fluctuating working capital should be collected through short-term sources of finance. Efficient utilization of working capital enhances operating efficiency as well as profit of the firms.

f) Temporary or Variable Working Capital

The additional current assets required at different times during the operating year to meet additional inventory, such as - extra cash-, is called temporary or variable working capital. According to Fabozzi and Peterson (2003 p. 678), - temporary working capital was defined as a rises of working capital from seasonal fluctuations in a firm's business.

Permanent working capital represents minimum amount of the current assets required through the year for normal production whereas temporary working capital is the additional capital required at different time of the year to finance the fluctuations in production due to seasonal change. A firm having constant annual production will also have constant permanent working capital and only variable working capital changes due to change in production caused by seasonal changes. (Figure 1)

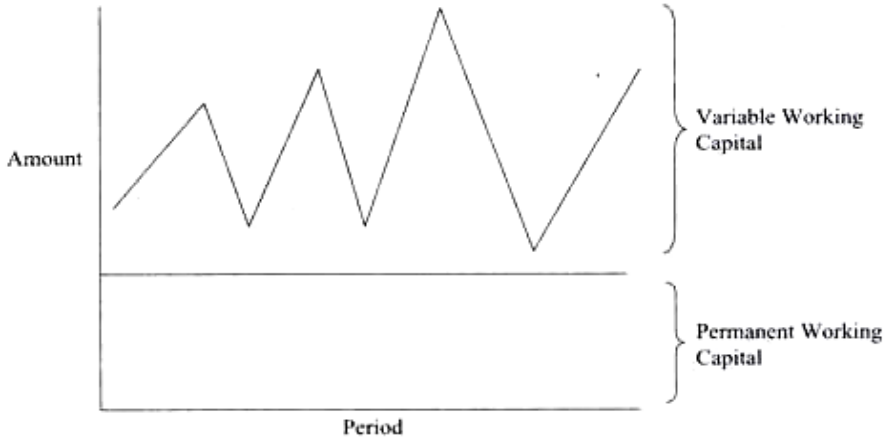


Figure 1 working capital of firms having constant annual sales (Board, 2009)

Similarly, a growth firm is the firm having utilized Capacity. However, production and operation continues to grow naturally. As its volume of production rises with the passage of time also does the quantum of the permanent working capital. (See figure 2)

Figure 2 working capital of a growth firm (Board, 2009)

2.3 Working Capital Management

Working capital management is important because of it causes firms' profitability, risk, and consequently its value. The greater the investment in current assets, the lower the risk, but also the lower the profitability obtained (Smith, 1980). Contrary to this, Carpenter and Johnson (1983) provided empirical evidence that there is no linear relationship between the level of current assets and revenue systematic risk of the United States (US) firms; however, some

indications of a possible nonlinear relationship were found, which were not statistically significant.

Working capital management involves finding the optimal levels for cash, marketable securities, account receivable and inventory and then financing that working capital at the least cost effective. Working capital management can generate considerable amounts of cash and efficient inventory usage (Brigham and Houston, p520, 2015)

The working capital management is influenced by the nature of business. A trading business needs to invest a great deal of money in the working capital as compared to the money required in the fixed assets. The similar case in point is related to a manufacturing business as well.

2.3.1 Current Asset Investment Policies

According to (Brigham and Houston, P 522, 2015) there are three alternatives policies regarding the size of current asset holdings.

- Relaxed investment policy = relatively large amount of cash, marketable securities and inventories are carried. This policy minimizes firm's risks but because of turns over it reduce Return on equity (ROE).
- Restricted investment policy (lean and Mean) = holdings of cash, marketable securities, inventories and receivables are constrained. It also indicates a low level of assets (a high total asset turnover ratio), which results in high ROE, other things held constant. However, this policy also exposes the firm risks because shortages can lead to work stoppages, unhappy customers and serious long- run problems.
- Moderate investment policy = an investment policy that is between the restricted and relaxed policy.

The optimal strategy is the one that maximizes the firm's long-run earnings. (Brigham and Houston, p.523, 2015)

2.3.2 Working Capital Policy

Working capital policy is a set of decisions on the level of investment and sources of financing current assets and liabilities (Kasumi and Ramada, 2012). To reduce the cash conversion cycle (CCC) and maximize firm profitability, owners and managers must formulate and implement appropriate WCP (Nyabuti and Alala, 2014).The policy calls for matching assets and liabilities maturities. Actually some factors prevent an exact maturity matching and when there is uncertainty about the lives of assets. The short term interest rates are, in most cases, cheaper compared to their long term counterparts. This is due to the amount of premium which is higher for short term loans. As a result, financing the working capital from long term sources means more cost. However, the risk factor is higher in case of short term finances. Whereas, during a short term sources, fluctuations in refinancing rates are a major cause and pose a major threats to business.

There are mainly three strategies that can be employed in order to manage the working capital. Each of these strategies considered the risk and profitability factors which contributed for pros and cons of a firms. The three strategies are:

- **Aggressive Policy**

In this policy, the entire variable working capital, either- some parts or the entire permanent working capital and sometimes the fixed assets are funded from short term sources. This results in significantly higher risks for any firms. The cost capital is significantly decreased in this policy that maximizes the profit. A firm may select an aggressive working capital policy, which adopts a lower ratio of total current assets to total assets or select an aggressive Working capital policy that focus in maintaining a higher ratio of total current liabilities to total assets (Afza and Nazir, 2007).

Firms with an aggressive WCP run the risk of heavy reliance on short-term debt to finance current assets, - whereas firms with a conservative WCP take the risk of high inventory costs and bad debts (Awopetu, 2012). If companies with an aggressive WCP are operating in stable markets and generating steady cash flows, they have a higher likelihood of having a short CCC and high potential for profitability (Al-Shubiri, 2011).An aggressive WCP is a high-risk, high-return strategy. An aggressive WCP is appropriate for firms operating in a stable market with

established products that generate a steady cash flow (Awopetu, 2012). Companies with aggressive WCP use only small investment in current assets and rely on current liabilities as a primary source of financing (Weinraub and Visscher, 1998).

- **Conservative Policy**

As the name suggests, the conservative strategy involves low risk and low profitability. In this strategy, apart from the permanent working capital, the variable working is also financed from the long term sources. This means an increased cost capital. However, it also means that the risks of interest rate fluctuations are significantly lower. The firm used a small amount of short term credit to meet its peak requirements. But it also meets part of its seasonal needs by storing liquidity in the form of marketable securities. Companies in volatile or seasonal industries such as construction might adopt conservative working capital policies to buffer against risk.

Bansal (1999) observes that due to the conservative policy of the corporation:-
I) Short-term creditor's position regarding their claim is threatened due to lack of funds,
ii) The company was not following uniform policy regarding the collection of debtors, and
iii) Inefficiency on the part of the management causes over investment in inventories.

As a result, a serious situation arose due to shortage of working capital. The author warns the corporation that if it did not plan its cash needs properly, it would be lead to bankruptcy. If companies with a conservative WCP are slow in converting inventory and receivables into cash, they have a higher likelihood of having a long CCC and little potential for profitability (Nyabuti and Alala, 2014).

A conservative policy is a low-risk low return strategy, which is appropriate for firms operating in a volatile market with uncertain demand for goods (Awopetu, 2012). Firms with a conservative WCP make a substantial investment in current assets to avoid the risk of stock out and loss of revenue (Bei and Wijewardana, 2012).

- **Moderate or Hedging Policy**

This approach involves moderate risks along with moderate profitability. In this policy, the fixed assets and the permanent working capital are financed from long term sources whereas the variable working capital is sourced from the short term sources. (Awopetu, 2012).

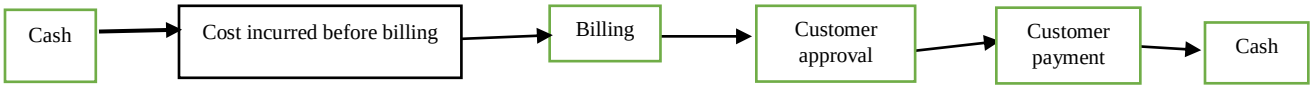
2.3.3 Cash Management

Cash is money that is easily accessible either in the bank or in the business. It's not inventory, it is not accounts receivables, and it is not property. These might have converted to cash at some point in time, but it takes cash on hand or in the bank to pay suppliers, to the rent, and to meet the payroll. Profit growth does not always mean more cash. A company usually acquires inventory on credit which results in account receivables. Cash, is not involved until the company pays the account receivables. So the cash conversion cycle measures the time between outlay of cash and cash recovery. (Diep, 2013)

According to Mike (2016) the formula used to calculate cash conversion cycle is represented as follows:

CCC = Average Collection Period + Inventory Turnover Day – Average Payment Period

The cash conversion cycle, also called the **net operating cycle**, is the number of days it takes a company to generate revenues with assets. Cash conversion cycle analyze the cash coming into and going out of the business and help make smarter decision and monitor projects effectively. A construction contract begins with cash. What happens next depends on the terms of the contract, but tends to follow this pattern:



(Mike, 2016)

CCC is used as an overall measure of working capital (WC), as it shows the gap between expenditure for purchases and collection of sales (Deloof, M. (2003)). Cash cycle also defined as "the time between cash disbursement and cash collection V. Ganesan. (2007).

2.3.4 Receivable Management

Receivable management aims to maximize the value of the firm by achieving a tradeoff between risk and profitability, (Diep, 2013). For this purpose, the financial management have to control the cost of receivables, cost of collection, administrative expense, and bad debt and so on.

Companies can control how well accounts receivable are managed using schedules and financial ratio. Whereas, financial ratio can be used to get an overall picture of how fast credit manager collect receivables. It's the length of time it takes to clear all accounts receivables, or how long it takes to receive the money for goods it sells. This is useful for determining how efficient the company is at receiving whatever short term payments it is owed (Steven J. Peterson, P134, 2015).

So, the average collection period is a measurement of the average time it takes a company to collect its accounts receivable or the average number of days that capital is tied up in accounts receivable. The collection period is also a measure of how long the company's capital is being used to finance client's construction projects. It may also be referred to as **the Average age of Accounts Receivable**. The collection period is calculated as follows:

Average collection Period = Accounts Receivable (365) / Revenues

Average collection period ratio explains how many days of credit a company is allowing to its customers to settle their bills (- Ramana and Rao, 2015-). - For the construction industry the collection period is affected by retention. Retention held is recorded as an accounts receivable when the work is completed but will not be available for release until the project is completed. This has the effect of lengthening the collection period. The greater the percentage of retention being held and the longer the project the greater this effect is. For an accurate measure of how long capital is being used to finance client's construction projects it is necessary to include the accounts receivable that are in the form of retention because retention is a source of capital to the project's owner.

However, including the accounts receivable that are in the form of retention in the calculation of the collection period distorts the collection period as a measure of how well a company is collecting the accounts receivable that are due to it. This is because no matter how aggressive a

company collects its accounts receivable it cannot collect the retention until the project is complete. A better measure of how well a company is collecting its accounts receivable is to exclude the accounts receivable that are in the form of retention from the calculations. When a company has met the requirement for receipt of the retention, the retention should be moved to the accounts receivable trade account, thus reflecting that the retention is now collectable.

A company's collection period should be less than 45 days. A collection period of more than 45 days indicates that the company has poor collection policies or has extended generous payment terms to its clients. For a company whose clients do not hold retention, this time should be reduced to 30 days. Reducing the collection period reduces a company's need for cash and may reduce the company's need for debt and the interest charges that accompany debt. Generous payment terms and slow collections often increase a company's reliance on debt, which increases its interest expenses and thereby reduces its profitability. (Steven J. Peterson, P134, 2015)

2.3.5 Inventories Management

Inventory is an important component of current assets. It consists of raw materials, work in process and finished goods available for sales. Hedrick, *et al* (2000), state that inventory management involves balancing the costs of inventory with the benefits of inventory. Successful inventory management involves creating a purchasing plan that will ensures that items are available when they are needed (but that neither too much nor too little is purchased) and keeping track of existing inventory and its use (Diep, 2013).

Efficient firms do not tie up more capital than they need in raw material and finished goods. They hold only a relatively small level of inventories of raw material and finished good and they turn over those inventories rapidly. Inventory includes materials that are available for sale or are available and expected to be incorporated into a construction project within the next year. Many construction companies have little or no inventory. Subcontractors are the most likely group of contractors to carry inventory. (Steven P26, 2015)

Inventory turnover ratio in days indicates the number of time the stock has been turned over sales during the period and evaluates the efficiency with which a firm is able to manage its inventory. It's calculated:

Inventory Turnover = Inventory / (Cost of Sales / 365)

The ratio shows how many times inventory has turned over to achieve the sales. Inventory should be maintained at a level, which balances production facilities and sale's needs. Higher the ITR, lower would be inventory holding period and vice versa (Ramana and Rao, 2015).

2.3.6 Payable Management

Payable management is the administration of a company's outstanding debts, or liabilities, to vendors for purchase of goods and services made on credit. Managing account payable is a crucial part of the cash flow cycle. Cash goes out of a business in 5 broad areas (Diep, 2013). They are operating costs, capital expenditure, loan repayments, tax, profits and dividends. Companies not only need to manage their account payables in good way but they should have the ability to generate enough cash to pay the mature account payables. It leads to the negative signal to the market and it will affect the share price, relationship with creditors and suppliers. Thus the company is difficult to raise more funds by borrowing money or get more from their supplies.

Therefore, payable management is very important. There is one way of controlling accounts payable is the average age of accounts payable. The average age of accounts payable represents the average time it takes a company to pay its bills and is a measure of how extensively a company is using trade financing. The average accounts age of accounts payable is the average amount of accounts payable divided by the total of the invoices that pass through the accounts payable for the period. The average age of accounts payable is often calculated as follows:

Average Age of Accounts Payable = Accounts Payable (365) / (Materials + Subcontract)

The underlying assumption is that the bulk of the invoices that pass through the accounts payable for the period are material and subcontract construction costs. When a significant amount of invoices for equipment, other construction costs, or general overhead pass through the accounts payable, they will lengthen out the average age of accounts payable because they will increase the

Numerator in without changing the denominator. To get a realistic measure of the average age of accounts payable a company may need to increase the materials and subcontract amount by the estimated amount of invoices from equipment, other construction costs, and general overhead that pass through the accounts payable account.

When the average age of accounts payable is greater than 45 days this is an indication that the construction company is slow to pay its bills and may receive less favorable credit terms and pricing from its suppliers and subcontractors. When the average age of accounts payable is shorter than 20 days—unless a construction company is taking advantage of trade discounts—it may be an indication that a company is underutilizing trade financing. If the average age of accounts payable is equal to or slightly greater than the collection period—calculated with retention—it is an indication that the construction company is using its suppliers and subcontractors to fund the construction work. If the average age of accounts payable is much greater than the collection period it may be an indication that the construction company is withholding payments from its suppliers

And subcontractors even after it has received payment for the work. If the average age of accounts payable is less than the collection period, the construction company is in the habit of using its working capital to pay bills before it has received payment from the owner. It is desirable for the average age of accounts payable to be equal to or slightly greater than the collection period.

2.3.7 Current Ratio

It is calculated as total current assets to total current liabilities. It is a key indicator of liquidity. This ratio shows how many times the current obligation can be paid off with the current asset. Current ratio indicates the ability of a company to manage the current affairs of business. It is useful to study the trend of working capital over a period of time. It is not only the quantum of current ratio that is important but also its quality, i.e. extent to which assets and liabilities are really current. Higher the current ratio, higher is the dependence on long term sources, better the liquidity but lower the profitability (Ramana and Rao, 2015). The current ratio is a measurement of a company's ability to use current assets to pay for current liabilities. The current ratio is calculated as follows:

Current Ratio =Current Assets / Current Liabilities.

A current ratio of 2 to 1 is considered a strong indication that a company is able to pay current liabilities. If a company's current ratio is below 1 to 1 it is an indication that the company does not expect to receive enough revenue over the next year to pay its current liabilities. To pay these liabilities the company needs to sell long-term assets or raise cash through debt or equity financing. If a company's current ratio is below 1.5 to 1 the company is undercapitalized and may run into financial problems during the next year. If a company's current ratio is over 2.5 to 1, the company may have too much of its assets tied up in current assets and should possibly be investing its assets in other long-term ventures or distributing them to its shareholders.

2.4 liquidity and Profitability

For number of years maintaining liquidity has been one of the prime goals of the firms and financial managers because, maintaining high or low liquidity affects the profitability of firm in an adverse manner. The profitability and liquidity, both are important goals for any firm, and to forego one goal at the cost of other can create serious problems for the firm. Profitability is a long term goal for any firm because it is required for the survival of the firm and firm will not continue to exist without profits. On the other hand liquidity is relatively shorter term goal which needs to be addressed to protect the firm from bankruptcy (Sharma, S. -1996-).

Different authors addressed this issue of maintaining a tradeoff between these two conflicting goals of profitability and liquidity but only gave a general approach to solve the problem. Waller, D. L.-(2002)-. Stated that increased investment in working capital is associated with decreased risk of inadequate liquidity, risk of lesser inventory for sales and risk of not granting credit for sales and production. Similarly -if the firm decreased investment in working capital, it will increase the above mentioned risks. Increased risk also increases profitability of the firm as the decreased investment in working capital can be used for some productive use. Weston and Brigham (1975) also discussed this trade off issue and suggested that investment in working capital should be made till that time marginal return are more than cost of invested capital. And working capital financing should be used instead of long term financing as long as their use does not increase firm's cost of capital. The study conducted by Waller, D. L. (2002) also encouraged the use of

more working capital assets but emphasized on the risk involved as the major determinant of degree of working capital investment.

A research by Smith (1980), Raheman & Nasr, (2007), also states the main purpose of any firm is to maximize profit. But, maintaining liquidity of the firm also is an important objective. The problem is that increasing profits at the cost of liquidity can bring serious problems to the firm. Thus, strategy of firm must maintain a balance between these two objectives of the firms.

First as found by Lazaridis and Tryfonidis (2006) companies may enjoy better pricing when they hold enough cash to purchase from own suppliers and thus they may enhance their profit. So having enough liquidity also affects the profitability of the firm. Secondly, Deloof (2003) has also proved that by minimizing the amount of funds tied up in current assets; firms can reduce financing costs and/or increase the funds available for expansion.

Referring to theory of risk and return, investment with more risk will result to more return. Accordingly, firms with high liquidity of working capital may have low risk then low profitability. On the contrary, firm that has low liquidity of working capital, facing high risk results to high profitability. The issue here is in managing working capital, firm must take into consideration all the items in both accounts and try to balance the risk and return.

Therefore, the profitability liquidity tradeoff is important because if working capital management is not given due considerations then the firms are likely to fail and face bankruptcy (Kargar & Bluementhal 1994). Efficient working capital management involves planning and controlling current assets and current liabilities in a manner that eliminates the risk of inability to meet due short term obligations on the one hand and avoid excessive investment in these assets (Eljelly (2004).

Smith, (1980) emphasized that profitability and liquidity comprised the silent goals of working capital management. Therefore, in the next portion of this chapter, we present the studies specifically on the relationship between working capital management and the profitability of a firm.

2.5 Working Capital Management and Profitability

Profitability can be termed as the rate of return on investment, if there is an unjustifiable over investment in working capital then, this would negatively affect the rate of return on investment -Vishnani & Shah, (2007)-. Therefore, the basic purpose of managing working capital is controlling of current financial resources of a firm in such a way that a balance is created between profitability of the firm and risk associated with that profitability.

As stated by Siddiquee and Khan (2008) it has been observed that, firms which are better at managing working capital are more profitable. They are also better at generating fund internally and also face lesser trouble while seeking external sources of financing.

Short-term assets and liabilities are important components of total assets and need to be carefully analyzed. Management of these short-term assets and liabilities warrants a careful investigation since the working capital management plays an important role in a firm profitability and risk as well as its value (Smith, 1980). Recent works of Deloof, (2003); Howorth and Westhead, (2003) and Afza and Nazir, (2008), state that firms try to keep an optimal level of working capital that maximizes their value.

According to Steven J. Peterson (2009) the return on assets is a measurement of how efficiently a construction company is using its assets and is often expressed as a percentage. The return on assets is calculated as follows:

Return on Assets = Net Profit after Taxes / Total Assets

Efficiently run companies will have a high return on assets, whereas companies that are poorly run will have a low return on assets.

2.6 Review of Empirical Studies

The previous section presented the theories of working capital management focusing on components, types of working capital, determinant of working capital requirement including working capital policies. This section reviews the empirical studies on the impact of working capital management on firms' profitability. There are a number studies that assessed working capital management from the perspective of both developing and developed nations.

Vinay (2015) conducted a study to analyze the effect of working capital management policy on profitability .The result shows that the liquidity of the company has an negative impact on profitability of 10 Indian infrastructure companies . When there is an increase in liquidity the profitability of the company decreases and vice versa. And there is inverse relationship between current ratio and profitability and positive relation of profitability to debt turnover.

Jagongo and Makori (2013) investigated the working capital management and firm profitability: empirical evidence from manufacturing and construction firms listed on Nairobi securities exchange, Kenya. There is a positive correlation between return on inventory holding period, average payable period and negative correlation between return on asset and the firms average collection period and cash conversion cycle. The study finds a negative relationship between profitability and number of day's accounts receivable and cash conversion cycle, but a positive relationship between profitability and number of days of inventory and number of day's payable. Moreover, the financial leverage, sales growth, current ratio and firm size also have significant effects on the firm's profitability.

AL-Mawsheki (2014) investigated the effect of working capital management on profitability of construction firms in Malaysia for a period of time between 2002 and2012. In order to do that, this study uses a balanced panel data of thirty construction firms that are on the list of Kuala Lumpur Stock Exchange. The results of the study show that cash conversion cycle, which is used as a proxy of working capital management, along with its components, receivable collection period and payable collection period has a significant and negative having an effect on the firms' profitability. However, the results showed that the inventory collection period has a negative but insignificant effect on the profitability. Additionally, there is a significant impact for the financial leverage, sales growth and firm size on the profitability of firms as well. The study concluded that the construction firms in Malaysia can develop their profitability by decreasing the inventory conversion period, cash conversion cycle, receivable collection period and payable collection period. The study also concluded and that construction firms are required to focus and develop their collection and payment policy.

Gill *et al*(2010) investigated the relationship between working capital management and profitability in United States firms by selected 88 American manufacturing and construction firms listed on New York Stock Exchange for a period of 3 years from 2005 - 2007. They found negative and statistically significant relationship between the cash conversion cycle and profitability, measured through gross operating profit.

Kulkanya (2012) studied the effects of working capital management on the profitability of the Thailand firms. The regression analysis was based on a panel sample of 255 companies listed on the Stock Exchange of Thailand from 2007 through 2009. The results revealed a negative relationship between the gross operating profits and inventory conversion period and the receivables collection period. Therefore, managers can increase the profitability of their firms by shortening the cash conversion cycle, inventory conversion period, and receivables collection period. However, they cannot increase profitability by lengthening the payables deferral period. The findings also demonstrated that industry characteristics have an impact on gross operating profits.

Chikore *el at al* (2014) examined the impact working capital management on profitability of non-financial firms of Zimbabwe and it found that there is a positive relationship between debtor's days and firm's profitability, a positive relationship between firm's cash conversion cycle and its profitability. Negative relationship between current ratio and profitability and also inventory turnover days and profitability are positive related.

Ramana and Rao, (2015) and Rao (1996) conducted a study on working capital management in Hindustan Construction Limited Company (HCL) India. The study conducted to analyze the working capital management practice of two significant players in the industry, namely, Hindustan Construction Company (HCC) and simplex infrastructure limited company (SIL).the study used seven ratios and statement of changes in working capital and observed that the company's working capital management is not up to the expected level. And the study makes of efficiency indices like current ratio, quick ratio, and inventory turnover ratio etc. of working capital management and the analysis shows that HCC needs to focus more on inventory and credit management whereas SIL should focus on receivable management. It should be improved by effective utilization and control of current asset.

Meszek *et al* (2006) examined the profiles of selected construction companies from the viewpoint of working capital formation and their management strategies applied to working capital. The analysis is based on the financial ratios. The authors conclude with the observation that complex working capital management requires controlling methodology to be developed. A specific character of the construction industry, including operational factors and market requirements make working capital management a task exceeding the financial sphere, as it embraces the issues of organization of investment processes, the organization of production processes and logistics.

Diep (2012) examined the impact of Working Capital Management on Construction firms profitability in Vietnam by selected a sample of selected 11 audited construction companies listed in Vietnam stock exchange for the period 0f 2010-2012 and analysis found a significant negative relationship between receivables collection period, inventory conversion period , average payment period, cash conversion cycle and profitability. The study also suggested that the impact of working capital management on firm's performance and highlight how managers affects firms profitability by managing working capital efficiently.

Deloof (2003) used a sample of 1009 Belgian companies during the period 1992-1996, he found a significant negative relationship between gross operating income and account receivable period, inventories and account payable of Belgian companies. The result suggest that managers can create value for their shareholders by reducing the account receivable period and inventories to reasonable minimum. The negative relationship between account payable and profitability is consistent with the view that less profitable firms wait longer to pay their bills.

2.8 Summary and Knowledge Gap

We described an overview of working capital including definition, concepts, nature and classification of a working capital. Working capital management policies, approaches and different components of working capital management which are cash conversion cycle, average payment, receivables, inventory, firm size and current ratio were mentioned. Furthermore, the relationship between working capital management and profitability and between liquidity and profitability are discussed. Finally, prior research in the field was described.

Generally, the existing studies indicates that working capital management has impacts on profitability of a firm. Therefore, there is still a vagueness regarding the appropriate variables, hypotheses and effect size measures that might serve as proxies for working capital management as a whole.

And also , in case of Ethiopia there are a few literatures such as Niman Ibrahim (2015),Henok Yohannes (2015), Wobshet Mengesha (2014) , 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) in Ethiopia 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 in Ethiopia has not been carried out so far . 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 is located in Addis Ababa, Ethiopia.

Chapter Three

Research Methodology

3. Introduction

The previous chapter indicated the literature on the impacts of working capital management on construction firm's profitability, and pointed out that there is limited research in Ethiopia. The intent of this chapter is giving brief outline of the broad objective of the study and hypothesis, the underlying principle of the research methodology and the choice of the appropriate research method for study.

3.1 Research Approach

According to Creswell (2003), the problem that is going to be investigated in the study is used as a base for determining the research approach. He noted that if the problem is identifying factors that influence an outcome, the utility of an intervention or understanding the best predictors in outcomes, then a quantitative approach is best. Therefore, to understand and analyze the impact of working capital management on profitability of construction in Addis Ababa, Ethiopia. The researcher has adopted a quantitative research approach.

In general Creswell (2009) stated three basic types of research approaches, i.e. qualitative, quantitative and mixed research approach. In the quantitative approach, results are based on numbers and statistics that are presented in figures, whereas in qualitative research approach where focuses on describing an event with the use of words. Mixed research approach, on the other hand, lies in between.

Thus, to gain a deeper understanding of the issue of impact of working capital management and profitability of construction company and ultimately to achieve the above mentioned objectives of this research study the researcher has used quantitative research approach. As noted by Yesgat (2009) the quantitative research approach translated the research problem in to specific variables and hypothesis to be tested (Yesgat, 2009, p.70). Thus, it enables the researcher to get a deep understanding about the area being investigated. In investigating the impact of working capital management on profitability of construction firms in Ethiopia, the researcher tried to test

the relationship between return on asset, which is a dependent variable, four explanatory variables and four control variables.

3.2. Method of Sampling and Sample size

As noted by Cohen et al. (2005) the "questions of sampling arise directly out of the issue of defining the population on which the research will focus". Further, they stated that "factors such as expense, time and accessibility frequently prevent researchers from gaining information from the whole population. Therefore they often need to be able to obtain data from a smaller group or Subset of the total population in such a way that the knowledge gained is representative of the total population under study" (Cohen et al. (2005) P.92).

This study was conducted on Ethiopian Construction Industry, in which a total of forty-five construction companies1 are operating at the moment and classified as a large construction companies by Ethiopian Revenue and Custom Authority. Therefore, as noted by Cohen et al. (2005), covering the entire construction firms in the study makes the study difficult. Therefore the researcher decided to draw only 17 companies as a sample from the total population. To give equal chance for each construction company being included in the sample, random sampling technique have been used. Thus only 17 construction companies, which is almost 40 percent of the total population, have, therefore, been drawn randomly from the whole population.
Sample companies are:-

1. Adam Construction
2. Afro Tsion Construction PLC
3. Akir Construction PLC
4. Aser Construction PLC
5. Blue Nile Construction
6. Defense Construction and Engineering Enterprise
7. DMC construction PLC
8. Dugda Construction PLC
9. Enyi Construction
10. Genet Construction PLC

11. Gift Construction PLC
12. Orchid Business Group PLC
13. OSAC Business PLC
14. Rama Construction PLC
15. Sunshine Construction PLC
16. SUR Construction PLC
17. Universal Construction

3.3. Source of data and Data Collection Instruments

To meet the objectives of this study, the researcher highly relayed on secondary source of data. Panel data i.e. annual financial report of 17 large tax payers construction companies, covering the period from 2008 to 2015 were used for the study. The specific data collected covering these eight years period considering the variables used in the study have been collected. To increase the reliability of the data used in the study and in order to avoid possible distortion of the data, audited financial statements of the companies were collected from Ethiopian Revenue and Custom Authority (ERCA) were collected and used. To further explain the result manuals, journal articles, books, doctoral and master thesis, and materials from different internet sites have been used as a supportive source of data.

The study adopted an explanatory research that used a quantitative research design through the use of secondary data. Schindler and Cooper (2001) discussed that explanatory studies unlike descriptive studies, go beyond observing and describing the condition and tries to explain the reasons of the phenomenon. According to Grover (2003) explanatory research is devoted to finding causal relationships among dependent and independent variables. It does so from theory-based expectations on how and why variables should be related. Hypotheses could be basic (i.e., relationships exist) or could be directional (i.e., positive or negative). The quantitative data gathering methods are useful especially when a study needs to measure the cause and effect relationships evident between pre-selected and discrete variables (Addisu, 2011).

The justification for this method is that it is expected to assist the researcher in explaining the impact of working capital management on the profitability of large construction companies in Addis Ababa, Ethiopia.

3.4 Model Specification, Variable Description and related Hypothesis

3.4.1 Model specifications

To analyses the impact of working capital management on profitability, the study used the following methods:

(i) Descriptive statistical analysis wherein a description of features of the data in the study such as mean and standard deviation of each variable is presented.

(ii) regression analysis is used to gauge the extent to which a unit change in each respective

Explanatory variable has on profitability. Pooled ordinary least squares method was used in regression analysis, wherein time series and cross-sectional observations is combined in determining the causal relationship between profitability variable and the independent variables used in the study.

General regression model

To examine the impact of working capital management on profitability of construction firms in Ethiopia, the model used by (Diep, 2013) has been adopted and adapted. Generally, this model is specified as:

$ROA_{it} = \beta_0 + \Sigma \beta_i X_{it} + \varepsilon_{it}$

Source: Diep, 2013

Where:

ROA_{it} are Return on Assets of firm i at time t; i= 1, 2, 3, 4…… 17 firms

β_0 is the intercept of the equation

β_i are coefficients of X_{it} variables

X_{it} are independent variables at time t

t = time= 1, 2…….8 years (from year 2008 to 2015)

ε_i is the error term

Specific regression model

Pooled OLS regressions are simply a linear regression applied to the whole data set. One of the biggest advantages of OLS method is that it relaxes the restriction of an enough large data set and simplicity. (Deloof, 2003; Garcia-Teruel &Martinez-Solano, 2006; Padachi, 2006) used OLS to investigate the impact of WCM on corporate profitability.

Four regression models were run in which one for all the variables based on selected sample companies. When the above general model is converted to the specified variables of this study the following regression equations was run to obtain the impact of working capital management on the performance of manufacturing firms.

i) Model Specification (I) regressed for accounts receivable period

Model 1: $ROA_{it} = \beta 0 + \beta 1 (ARP_{it}) + \beta 2 (CR_{it}) + \beta 3 (SG_{it}) + \beta 4 (QR_{it}) + \beta 5 (FS_{it}) + \varepsilon_{it}$

ii) Model Specification (II) regressed for inventory holding period

Model 2: $ROA_{it} = \beta 0 + \beta 1 (IHP_{it}) + \beta 2 (CR_{it}) + \beta 3 (SG_{it}) + \beta 4 (QR_{it}) + \beta 5 (FS_{it}) + \varepsilon_{it}$

iii) Model Specification (III) regressed for accounts payable period

Model 3: $ROA_{it} = \beta 0 + \beta 1 (APP_{it}) + \beta 2 (CR_{it}) + \beta 3 (SG_{it}) + \beta 4 (QR_{it}) + \beta 5 (FS_{it}) + \varepsilon_{it}$

iv) Model Specification (IV) regressed for cash conversion cycle

Model 4: $ROA_{it} = \beta 0 + \beta 1 (CCC_{it}) + \beta 2 (CR_{it}) + \beta 3 (SG_{it}) + \beta 4 (QR_{it}) + \beta 5 (FS_{it}) + \varepsilon_{it}$

Where: $\beta 0$ = intercept of the regression,

$\beta 1$, $\beta 2$, $\beta 3$, $\beta 4$, and $\beta 5$ = coefficients on each respective explanatory variables,

ROA_{it} = Return on asset – for firm i at corresponding time t.

ARP_{it} = Account receivable Period – for firm i at corresponding time t.

IHP_{it} = Inventory holding period - for firm i at corresponding time t.

APP_{it} = Account payable period - for firm i at corresponding time t.

CCC_{it} = cash conversion cycle - for firm i at corresponding time t.

CR_{it} = Current ratio - for firm i at corresponding time t.

SGit = Sales growth for firm i at corresponding time t.

QRit = Quick ratio for firm i at corresponding time t.

FSit = Size of firm i at corresponding time t.

t = time= 1, 2…. 8 (from year 2008 to 2015), and

εit = is the error term of the regression – for firm i at time t

In the first regression model, the ARP has been regressed against the ROA. In the second regression model, the IHP has been regressed against the ROA. The third regression model involves a regression of the APP against the ROA. In the fourth regression model, the CCC is regressed against the ROA.

3.4.2 Variable Description

Dependent Variable

The dependent variable are variables that are used to measure the profitability of firms. In order to analyses the impact of working capital components on the profitability of construction firms in Ethiopia, profitability is measured by return on assets (ROA). The dependent variable in this study is return on asset, calculated by dividing a company's annual earning by its total assets, it is displayed as a percentage. Several recent studies have used ROA as a proxy for firm's profitability such as (Miftah and Zelalem, 2016).

Independent variable

As an independent variables the researcher has tested a total of four firm specific explanatory variables i.e. cash conversion cycle, account receivable period, inventory holding period and account payable period. The description of those explanatory variables and related hypothesis is described as follows;

3.4.2.1. Average Collection Period (ARD)

It is used as a proxy for the collection policy of firms. ACP is equal to (Debtors/Credit Sales) x 365. This ratio explains how many days of credit a company is allowing to its customers to settle their bills (Ramana and Rao, 2015) and also (Fried *et al*, 2003) state that average collection period measures the effectiveness of the firms credit policy. It indicates the level of investment in receivables needed to maintain the firm's sales level.

3.4.2.2. Inventory turnover in days (ITD)

It is used as a measure for the inventory policy of firms. Is the number of times inventory turned over in a year? It is relationship between Cost of Goods Sold and average inventory at cost (Shim & Siegel, 1998).It shows how many times inventory has turned over to achieve the sales. Inventory should be maintained at a level, which balances production facilities and sale's needs. Higher the ITR, lower would be inventory holding period and vice versa (Ramana and Rao, 2015).

ITD = (Inventory / Cost of Goods Sold) x 365

3.4.2.3. Average payment period (APP)

It is used as proxy for the payment policy of firms. The average period of length among material that purchased and labors the payment to them in the form of cash. The firm required to more time for payment of their dues, the delay in

Payment of the firm dues has positive impact on the firm's profitability.

APP = Accounts Payable / Net Purchase * 365…..…… (Abdul *el at al*, 2015)

3.4.2.4. Cash conversion cycle (CCC)

Which is used as a comprehensive measure of working capital management. The CCC start when the raw material purchase and not pay at the spot. The stay in giving the due is the outcome in delay in the payable duration. The firm uses the raw material which will be converting into finished goods for sale (Abdul *et al*, 2015). Many authors like Sharma and Kurma (2011) have argued that it is important for firms to shorten the CCC, as managers can create value for owners by reducing the cycle to a reasonable minimum level.

The cash conversion cycle, therefore, indicates the average length of time that money is tied up in current assets. A longer time of inventory held and collection of receivables and a shorter time for payments to a firm's creditors imply that cash is being tied up in inventory and receivables and used more speedily in paying off trade payables. If a firm always faces this situation, it will decrease, or squeeze, the firm's available cash. Therefore, a shorter cash conversion cycle reduces a firm's cash needs ….Napompech (2012).

Cash Conversion Cycle = Receivable Turnover in Days + Inventory Turnover in Days – Payable Turn over in Days

CCC = ACP + ITID – APP …… (Abdul *et al*, 2015)

3.4.3. Control Variable

3.4.3.1 Current ratio (CR)

It is used as a traditional measure of firm's liquidity.it establish a relationship between current asset and current liabilities. Normally, high current ratio is considered to be high a sign of financial strength (Abdul *et al*, 2015). It is the indicator of the firm's ability to promptly meet its short term liabilities (Abdul *et al*, 2015, Miftah, 2016, Zelalem, 2016) had used this variable in their research.

3.4.3.2. Firm Size

Firm size was calculated as natural logarithms of total assets. This control variable is operational in two ways in the literature of WCM. The first type uses the natural logarithm of total assets to determine the size of a firm. This is used in the studies of Samiloglu and Demirgunes (2008) and Sharma and Kumar (2011). But the most widely used type of measurement is the natural logarithm of sales, which is used by Padachi et al. (2010), Dong and Su (2010), Deloof (2003), Raheman and Nasr (2007) and Karaduman et al. (2011). In this study the natural logarithm of sales will be used as a measurement for size, because it is often used in the working capital literature. The LnSales measures the size of the company and allows checking its relationship with profitability.

The size of the firm is measured as logarithm of Sales

Size of Firm = Natural Log of Sales

3.4.3.3. Quick ratio

Quick ratio (also known as asset test ratio) is a liquidity ratio which measures the dollars of liquid current assets available per dollar of current liabilities. Liquid current assets are current assets which can be quickly converted to cash without any significant decrease in their value. Liquid current assets typically include cash, marketable securities and receivables. Quick ratio is expressed as a number instead of a percentage.

To further evaluate liquidity, the quick, or acid-test, ratio is computed just like the current ratio, except inventory is omitted:

$$\text{Quick ratio} = \frac{\text{Current assets} - \text{Inventory}}{\text{Current liabilities}}$$

- Stephen A. Ross- fundamental of corporate finance (2000) and Accounting explained.com

3.4.4.4 Sales growth

One of the control variables that is used in the regression by Zariyawati, Annuar, Taufiq , Abdul Rahim (2009) and Niman Ibrahim (2016) is **(Sales1 – Sales0) / Sales0** while Deloof (2003) computed sales growth as **[(This year's sales – Previous year's sales)/Previous year's sales]**.

Other researchers which have also included sales growth as part of the control variables in their studies are Falope and Ajilore (2009) and Nazir and Afza (2009). Thus, in this study, sales growth is measured by the following formula:

- **Sales Growth = Sales1 – Sales0 / Sales0**

According to Akinlo (2012), sales growth is anticipated to have a positive relation with profitability in view that higher achievement in sales growth is derived as a result of better quality of product or services, lesser time required to evaluate the quality of the products, which leads to lower accounts receivables days and positive impact on profitability. The positive

association between sales growth and profitability is also supported by other researchers (Deloof, 2003; Zariyawati, Annuar, Taufiq and Abdul Rahim, 2009; Raheman, Afza, Qayyum and Bodla, 2010).

- Table 3 Summary of explanatory variables and their expected effect on the dependent variables

Classification	Variables	Description	Measurement	Expected effect
Dependent variable	Return on asset	Indicate of how profitable a company is relative to its total assets.	Percentage	NA
Independent variable	Average collection period (1)	explains how many days of credit a company is allowing to its customers to settle their bills	Percentage	Negative
	Inventory turnover in days (2)	Explain the number of times inventory turned over in a year	Percentage	Negative
	Average payment period (3)	Explain the average period of length among material that purchased and payment to the labors	Percentage	Positive
	Cash conversion period	Indicates the average length of time that money is tied up in current assets	The sum of (1) + (2) + (3)	Negative
Control variables	Current ratio	It shows relationship between current asset	Percentage	--

		and current liabilities		
	Firm size	Determine the size of the firm	Natural logarithm of total asset	--
	Quick ratio	Explain the birr of liquid current assets available per birr of current liabilities	$\frac{CA - INV}{CL}$	--
	Sales growth	Shows the amount by which the average sales volume of a company's product or service has grown, typically from year to year.	Percentage	--

Chapter Four

4. RESULTS AND DISCUSSION

Data analysis

First, this study collects the needed data from selected construction firms who agree to provide their financial statement to the study. After that, collected data are rearranged, edited and calculated in order to become complete data that is needed for this study. Next, these collected data are analyzed by using STATA and EVIEW. The last step is interpreting the result of STATA and output.

4.1 Descriptive statistics for the study variables

In this section the results from descriptive statistics was discussed. Table 4.1 below presents descriptive statistics of the dependent and independent variables of the study. It shows the mean and standard deviation of the variables used in the study. In addition, it shows the minimum and maximum values of each respective variable which essentially gives an indication of how wide ranging each respective variable can be.

Table 4.1 Descriptive statistics

Variable	Obs	Mean	Std.Dev.	Min	Max
ROA	136	0.1485294	0.0606573	-0.03	0.31
ARP	136	87.91912	34.87396	10	171
IHP	136	230.9853	46.67079	123	331
APP	136	176.8235	30.5689	109	241
CCC	136	142.0809	53.22211	24	248
CR	136	2.600735	0.5361725	1.5	3.9
QS	136	1.022794	0.415615	0.1	2.1
FS	136	8.013162	0.581832	6.54	9.34
SG	136	0.1970588	0.1064659	-0.1	0.53

Source: STATA output results and authors computation 2008-2015

Table 4.1 presents descriptive statistics for 17 construction firms companies in Ethiopia for a period of eight years from 2008 to 2015.The study has used nine variables for the analysis purpose which was classified in to four dependent , four control and one dependent variable. The dependent variable which measures the profitability of the firm is return on asset. Out of eight independent variables, four are (accounts receivable period, inventory holding period, accounts payable period and cash conversion cycle) proxies for profitability of the sample firms. The remaining four independent control variables used are firm size as measured by natural logarithm of sales, quick ratio, sales growth rate measured by the relative change in sales as compared to previous year and current ratio which measures liquidity.

As it is shown in table 4.1, the mean value of return on assets is around 14.85 percent and standard deviation is 6. 06 percent. It means that value of profitability can deviate from mean to both sides by 6.06 percent. The minimum value of return on asset is -3 percent while the maximum is 31 percent.

Firms under the study receive payment on sales on average of 88 days and it can vary by 35 days to both sides of the mean value. The minimum and maximum account receivable period for the sampled firms is 10 and 171 days respectively.

The descriptive statistics show that it takes on average of 231 days to sell inventory. The standard deviation of inventory holding period is 47 days with 123 and 331 days as minimum and maximum values respectively.

On average, firms wait 177 days to pay for their purchases. Its standard deviation for the firms under study is 31 days which deviates from both sides of the mean value. The accounts payable period ranges from 109 to 241 days to pay their credit purchases.

The cash conversion cycle, used as a comprehensive measure of working capital management has an average 142 days and the standard deviation of 53 days. The minimum value of the cash conversion cycle shows 24 days and on the other way, the maximum time for the cash conversion period is 248 days.

Table 4.1 also includes the descriptive statistics of control variables used in the study. A traditional measure of liquidity (current ratio) shows that on average construction firms companies keep current assets at 2.6 times current liabilities with a standard deviation of 0.53. The highest current ratio for a firm in the study period is 3.9, with the lowest at 1.5.

The results of descriptive statistics show that the quick ratio for the construction firms are companies is 1.02 with a standard deviation of 0.41. The maximum ratio used by the firm is 2.1 and its minimum level is 0.1.

The other control variable, firm size, as measured by the natural logarithm of annual sales, is 8.01 on average and standard deviation is 0.58. The minimum and maximum values of firm size for the firm measured by natural logarithm of annual sales are 6.54 and 9.34 respectively.
Lastly, the firm sales growth measured by changes in annual sales has an average of 19.7% and there is a deviation of 10.64 percent from mean value of sales growth to both directions. The sales growth among the study firms is ranged from -10 percent to 53 percent.

4.2 Model selection criteria (Random vs. Fixed effect model)

In this research the method used in each model is selected based on the Correlated Random Effects-GLS regression. The GLS regression that examines whether the unobservable heterogeneity term is correlated with explanatory variables, while continuing to assume that repressors are uncorrelated with the disturbance term in each period. The null hypothesis for this test is that unobservable heterogeneity term is not correlated or random effect model is appropriate, with the independent variables. If the null hypothesis is rejected then we employ Fixed Effects method. (Padachi, 2006).

The pooled regression assumes that the intercepts are the same for each firm. This may be an inappropriate assumption; (Brooks, 2008) recommended that we could instead estimate a model with firm fixed effects, which will allow for latent firm specific heterogeneity. The simplest types of fixed effects models allow the intercept in the regression model to differ cross-section ally. To determine whether the fixed effects are necessary or not, this study run a redundant fixed effects test as recommended by (Brooks, 2008) and others using GLS regression
H0: Random Effects model is appropriate
H1: Fixed Effects model is appropriate
Decision Rule: Reject H0 if the value less than significance level 5%. Otherwise, do not reject H0. According to the results presented below the study adopt fixed effects model

Table 4.2 Redundant fixed effect test

Model 1: ROA C ARP CR QR SG FS

Correlated Random Effects - Hausman Test

Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	45.68	5	0.0000

Model 2: ROA C IHP CR QR SG FS

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	44.75	5	0.0000

Model 3: ROA C APP CR QR SG FS

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	45.19	5	0.0000

Model 4: ROA C CCC CR QR SG FS

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	45.87	5	0.0000

Source: E-Views output results and author's computation 2008-2015.

4.3 Diagnostic tests

Diagnostic tests are robust statistical tests carried out to verify if the data used have met the assumptions underlying the ordinary least squares regression and where possible to remove problems associated with panel data. The diagnostic tests carried out in the study are detailed below.

4.3.1. Test for average value of the error term is zero (E (ut) = 0) assumption

the first assumption required is that the average value of the errors is zero. In fact, if a constant term is included in the regression equation, this assumption will never be violated. Therefore, since the constant term (i.e. α) was included in the regression equation, the average value of the error term in this study is expected to be zero.

4.3.2 Heteroscedasticity

According to (Brooks, 2008), Heteroscedasticity means that error terms do not have a constant variance. If Heteroscedasticity occur, the estimators of the ordinary least square method are inefficient and hypothesis testing is no longer reliable or valid as it will underestimate the variances and standard errors. There are several tests to detect the Heteroscedasticity problem, which are Park Test, Glesjer Test, Breusch-Pagan-Goldfrey Test, White's Test and Autoregressive Conditional Heteroscedasticity (ARCH) test. This study used Breusch-Pagan-Goldfrey test to detect the presence of Heteroscedasticity.

H0: The model is Hetroscedasticity

H1: The model is Homoskedastic

Table 4.3 Breusch-Pagan Godfrey Test for Heteroskedasticity

Model 1: ROA C ARP CR QR SG FS

Heteroskedaticity Test: Breusch –Pagan Godgrey

F-statistic	0.860698	Prob. F(5,145)	0.5097
Obs*R-squared	4.361754	Prob. Chi-Square(5)	0.4986
Scaled explained SS	6.600071	Prob. Chi-Square(5)	0.2521

Model 2: ROA C IHP CR QR SG FS

Heteroskedaticity Test: Breusch –Pagan Godgrey

F-statistic	0.958263	Prob. F(5,145)	0.4463
Obs*R-squared	4.837351	Prob. Chi-Square(5)	0.4361
Scaled explained SS	6.064617	Prob. Chi-Square(5)	0.3000

Model 3: ROA C APP CR QR SG FS

Heteroskedaticity Test: Breusch –Pagan Godgrey

F-statistic	0.488367	Prob. F(5,145)	0.7844
Obs*R-squared	2.512222	Prob. Chi-Square(5)	0.7747
Scaled explained SS	3.482017	Prob. Chi-Square(5)	0.6261

Model 4: ROA C CCC CR QR SG FS

Heteroskedaticity Test: Breusch –Pagan Godgrey

F-statistic	0.359696	Prob. F(5,145)	0.8751
Obs*R-squared	1.860013	Prob. Chi-Square(5)	0.8682
Scaled explained SS	2.277131	Prob. Chi-Square(5)	0.8096

Source: E-Views output results and author's computation 2008-2015.

4.3.3. Testing for serial correlation

Serial correlation is usually a result of model Mis-specification or genuine autocorrelation of the model error term. In the presence of such a phenomenon, ordinary least squares are no longer BLUE (Best Linear Unbiased estimators). In such cases R-squared may be overestimated.

There was thus every need to test for serial correlation in the residuals.

According to Brooks (2008) when the error term for any observation is related to the error term of other observation, it indicate that autocorrelation problem exist in this model. In the case of autocorrelation problem, the estimated parameters can still remain unbiased and consistent, but it is inefficient. The result of T-test, F-test or the confidence interval will become invalid due to the variances of estimators tend to be underestimated or overestimated.

Due to the invalid hypothesis testing, it may lead to misleading results on the significance of parameters in the model. Breusch-Godfrey Serial Correlation LM Test was used to detect autocorrelation problem.

Ho: ρ=0, i.e. no serial correlation

H1: ρ=1 i.e. presence of serial correlation

Decision Rule: Reject H0 if p-value less than significance level. Otherwise, do not reject Ho.

Hence all the models used in this study have no serial correlation.

Table 4.4 Breusch-Godfrey Serial Correlation LM Test

Model 1: ROA C ARP CR QR SG FS

Breusch-Godfrey Serial Correlation LM Test

F-statistic	2.163038	Prob. F(2,143)	0.1195
Obs*R-squared	4.454952	Prob. Chi-Square(2)	0.1078

Model 2: ROA C IHP CR QR SG FS

Breusch-Godfrey Serial Correlation LM Test

F-statistic	1.324388	Prob. F(2,143)	0.2699
Obs*R-squared	2.765294	Prob. Chi-Square(2)	0.2509

Model 3: ROA C APP CR QR SG FS

Breusch-Godfrey Serial Correlation LM Test

F-statistic	1.785360	Prob. F(2,143)	0.1722
Obs*R-squared	3.699753	Prob. Chi-Square(2)	0.1573

Model 4: ROA C CCC CR QR SG FS

Breusch-Godfrey Serial Correlation LM Test

F-statistic	1.995810	Prob. F(2,143)	0.1404
Obs*R-squared	4.121709	Prob. Chi-Square(2)	0.1273

Source: E-Views output results and author's computation 2008-2015.

4.3.4 Testing for normality

Normality is a condition in which the variables to be used in the model follow the standard normal distribution. The Jarque-Bera statistics was used to test the normality of the variable under different conditions and under the hypotheses;

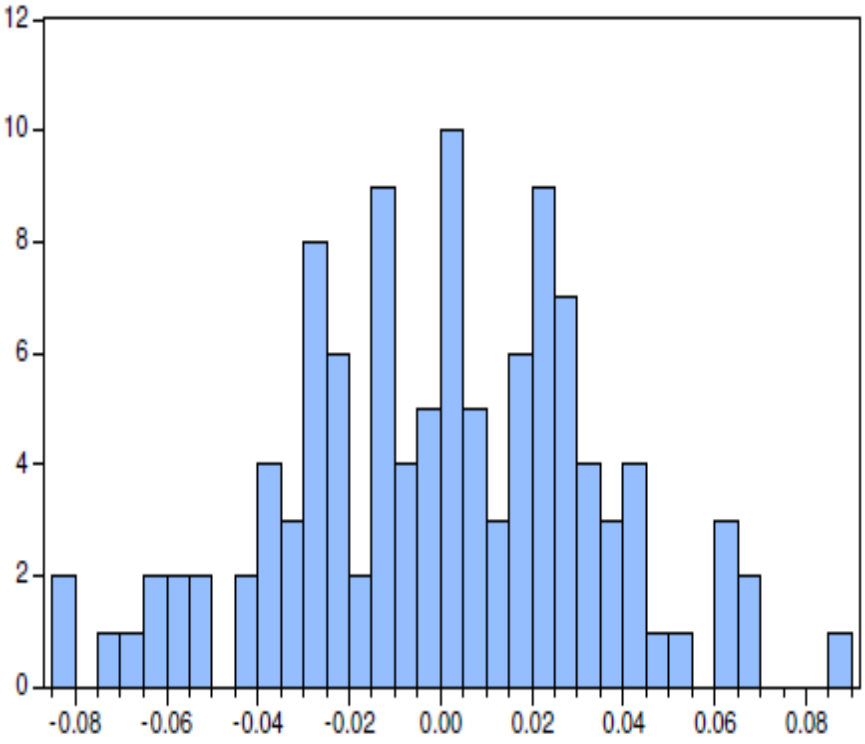
Ho: The series is normally distributed

H1: The series is not normally distributed

If the series are normally distributed, the histogram should be bell shaped and the Jarque- Bera statistic insignificant.

Model 1: ROA C ARP CR QR SG FS

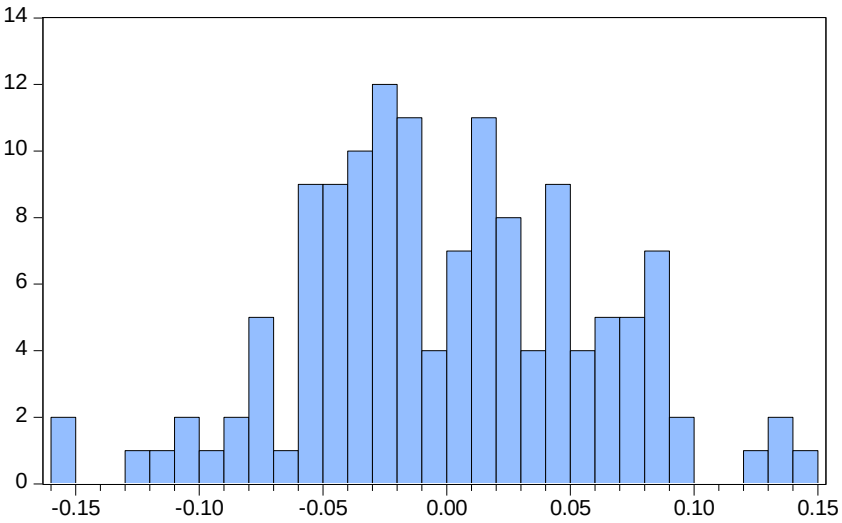
Figure 4.1: Normality test for the model effect of ARP on ROA



Source: E-views output results and authors computation 2008-2015.

Model 2: ROA C IHP CR QR SG FS

Figure 4.2: Normality test for the model effect of IHP on ROA

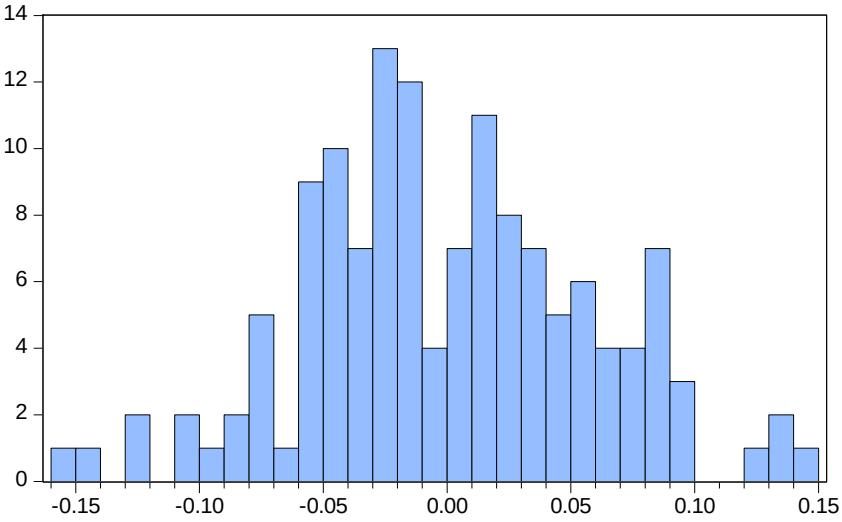


Series: Standardized Residuals	
Sample 2008 2015	
Observations 136	
Mean	4.90e-18
Median	-0.005991
Maximum	0.146079
Minimum	-0.153295
Std. Dev.	0.057819
Skewness	0.015347
Kurtosis	3.005023
Jarque-Bera	0.005482
Probability	0.997263

Source: - E-views output results and authors computation 2008-2015

Model 3: ROA C APP CR QR SG FS

Figure 4.3: Normality test for the model effect of APP on ROA

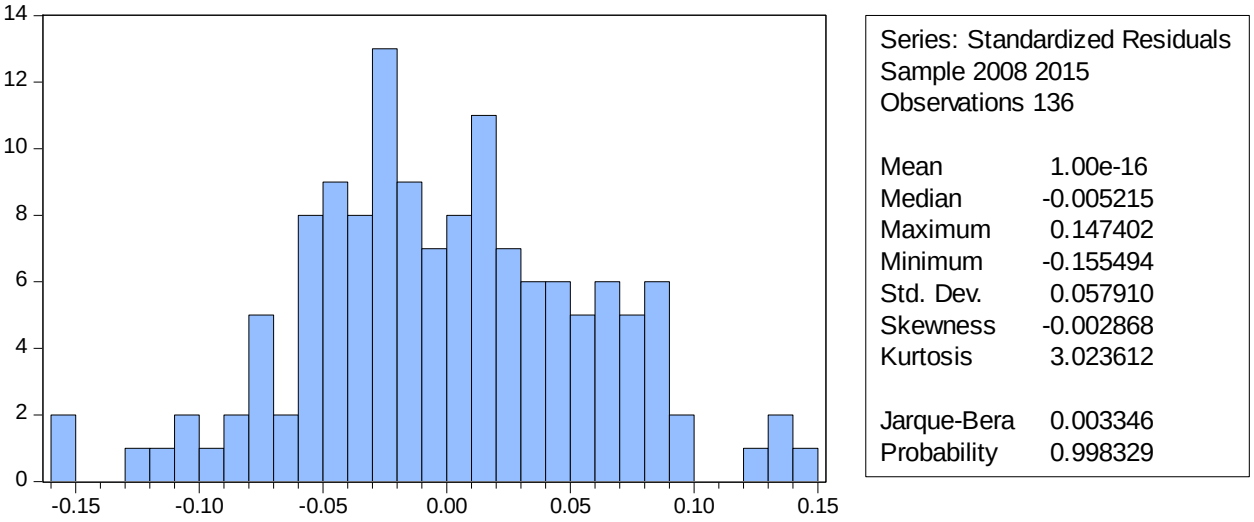


Series: Standardized Residuals	
Sample 2008 2015	
Observations 136	
Mean	-8.15e-17
Median	-0.006537
Maximum	0.149517
Minimum	-0.154526
Std. Dev.	0.058035
Skewness	0.030083
Kurtosis	3.023744
Jarque-Bera	0.023708
Probability	0.988216

Source: - E-views output results and authors computation 2008-2015

Model 4: ROA C CCC CR QR SG FS

Figure 4.4: Normality test for the model effect of CCC on ROA



Source: - E-views output results and authors computation 2008-2015

4.3.5 Test for Multi-collinearity

Multi-collinearity is an assumption of a linear relationship between explanatory variables that creates biased regression model. This problem occurs when the explanatory variables are very highly correlated with each other (Brook, 2008). According to (Hair et al., 2006)

Multicollinearity problem exists when the correlation coefficient among the variables are greater than 0.90. However, (Kennedy, 2008) suggested that any correlation coefficient above 0.7 could cause a serious Multicollinearity problem as it appears in the correlation matrix in the below tables all the modes are less than the stated value.

Table 4.5: Correlation matrix between explanatory variables

	. Correlate ROA ARP IHP APP CCC CR QR FS SG								
	ROA	ARP	IHP	APP	CCC	CR	QR	FS	SG
ROA	1.000								
ARP	-0.1203	1.000							
IHP	-0.1291	0.3475	1.000						
APP	0.2178	-0.1144	-0.2134	1.000					
CCC	-0.0907	0.4162	-0.5266	0.4622	1.000				
CR	-0.2109	-0.2611	-0.0890	-0.1280	-0.0196	1.000			
QR	-0.2146	0.2591	-0.0704	0.1305	0.0331	0.1935	1.000		
FS	-0.0829	0.2740	0.0895	0.0160	0.0919	0.1311	0.1411	1.000	
SG	0.1753	-0.1172	0.0929	-0.2383	-0.1322	0.0379	0.0471	-0.0522	1.000

Source: source SPSS output from financial statements of sample companies, 2008 - 2015

4.4 Regression results

Following descriptive statistics and diagnostic tests presented in sections 4.2 and 4.3 respectively, the regression analysis in this section is used to shed more light on the impact of working capital management components on firm profitability.

Consistent with Garcia-Teruel and Martinez-Solano (2006) and Mathuva (2010), the study estimates determinants of firm's profitability using ordinary least squares in which four (4) regression models have been run in order to investigate the impact of management of working capital on firm's profitability.

4. 4 .1 Regression result of model specification I

Model specification I regressed effect of accounts receivable period on ROA.

Model 1: ROAit = β0 + β1 (ARPit) + β2 (CRit) + β3 (SGit) + β4 (QRit) + β5 (FSit) + εit

Table 4.6 Regression results of profitability measures and ARP

Dependent Variable: ROA
Method: Panel Least Squares
Date: 07/01/17 Time: 12:29
Sample: 2008 2015
Periods included: 8
Cross-sections included: 17
Total panel (balanced) observations: 136

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.140757	0.189042	0.744579	0.458058
ARP	-0.000852	0.001035	-0.823157	0.002137
FS	-0.000202	0.020682	-0.009788	0.992207
SG	-0.002447	0.003130	-0.781760	0.435976
QR	0.064494	0.021838	2.953263	0.003819
CR	0.008084	0.014911	0.542141	0.009978

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.580707	Mean dependent var	0.148529
Adjusted R-squared	0.503469	S.D. dependent var	0.060657
S.E. of regression	0.0427499	Akaike info criterion	-3.320191
Sum squared resid	0.208265	Schwarz criterion	-2.849027
Log likelihood	247.773040	Hannan-Quinn criter.	-3.128722
F-statistic	7.518403	Durbin-Watson stat	2.075010
Prob(F-statistic)	0.000000		

Source: E-views output results and author's computation 2008-2015

Table 4.6 reveals the summary statistics of regression specification 1. The explanatory power of the model as can be seen is that the adjusted R squared values are equal to 50 percent. This implies that 50 percent of the variation in the return on assets can be explained by the variables used in the model. The Adjusted R-squared values in this study are found to be sufficient to infer that the fitted regression line is very close to all of the data points taken together (has more explanatory power). The F statistic is used to test the model specification. From the table 4.5 the result of one can see that the model is fit with F-statistics 7.51at p-value of 0.0000.

The regression results in table 4.5 indicate that holding other things constant a day increase in day's sales receivable is associated with a decrease in 0.0852 percent in profitability and statically significant.

The result consistent with conducted by Samiloglu F. and Demirgunes K. (2008), Gakure,Cheluget, Onyango and Keraro (2012); Mathuva (2010); and Filbeck, *et al*. (2005) which found a significant relationship between average collection period and profitability. And empirical results of this study show a significant negative relationship between accounts receivable period and firm's profitability. This negative relationship indicates that slow collection of accounts receivables is correlated with low profitability. Therefore, whenever collection period increases bad debt increases and hence profitability will full down and vice versa.

The regression result for current ratio (CR) which is a traditional measure of liquidity implies a unit increase in current ratio is associated with an increase in 0.8084 percent and statistically significant at 5 %.

The size of a company shows a negative relationship with profitability which means that bigger size firms have less profitability compared to firms of smaller size. The regression coefficient of 0.0202 is signifying that size of the company is playing less role for firms' profitability in which an increase in size would lead to a decrease in profitability.

The results from regression model specification I are used to determined hypothesis stated in chapter one as shown in 1.4 section. The first research hypothesis was that accounts receivable period have significant negatively related to a firm's profitability. In conformity with hypothesis, the indicator of profitability, return on assets is negatively and significantly related with accounts receivable period and significant at 5% so, the null hypothesis are true.

4.4.2 Regression result of model specification II

Model specification II regressed effect of inventory holding period on ROA.

Model 2: ROAit = β0 + β1 (IHPit) + β2 (CRit) + β3 (SGit) + β4 (DRit) + β5 (FSit) + εit

Table 4.7 Regression results of profitability measures and IHP

Dependent Variable: ROA
Method: Panel Least Squares
Date: 07/01/17 Time: 12:58
Sample: 2008 2015
Periods included: 8
Cross-sections included: 17
Total panel (balanced) observations: 136

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.083678	0.217879	0.384056	0.701652
IHP	-4.131629	0.000674	-0.061213	0.951296
FS	-0.001084	0.020831	-0.052037	0.958590
SG	-0.002816	0.003109	-0.905662	0.367024
QR	0.064900	0.0218979	2.963744	0.003700
CR	0.007695	0.014986	0.513470	0.000000
	Effects Specification			
Cross-section fixed (dummy variables)				
R-squared	0.578229	Mean dependent var		0.148529
Adjusted R-squared	0.500534	S.D. dependent var		0.060657
S.E. of regression	0.042868	Akaike info criterion		-3.314298
Sum squared resid	0.209496	Schwarz criterion		-2.843133
Log likelihood	247.372296	Hannan-Quinn criter.		-3.122829
F-statistic	7.442327	Durbin-Watson stat		2.272307
Prob(F-statistic)	0.000000			

Source: E-views output results and authors' computation 2008-2015

Table 4.7 reveals the summary statistics of regression specification III. The explanatory power of the model as can be seen is that the adjusted R squared values are equal to 57.8 percent. This implies that 57.8 percent of the variation in the return on assets can be explained by the variables used in the model. The Adjusted R-squared values in this study are found to be enough to infer that the fitted regression line is very close to all of the data points taken together (has more explanatory power). The F statistic is used to test the model specification, from the table 4.3 result of one can see that the model is fit with F- statistics7.44 at p-value of 0.0000.

The regression result for inventory holding period in table 4.7 implies a day increase in inventory holding period is associated with a decrease in profitability by 4.31 percent but statistically insignificant. However, the results of this study are consistent with the results of the studies conducted by Padachi(2006), Garcia-Teruel and Martinez-Solano (2007), Deloof (2003),Raheman and Nasr (2007) , Samiloglu F. and Demirgunes K. (2008) , Raheman, Afza, Qayyum, & Bodla (2010) in their respective analysis of the relationship betweenprofitability and number of days of inventory.

Makori and Jagongo (2013) also found a positive relationship between the inventory conversion period and profitability. They concluded that maintaining high inventory levels reduces the cost of possible interruptions in the production process and the loss of business due to scarcity of products.

Another important observation that can be made from table 4.3 is that the conventional measure of liquidity, i.e., current ratio, is significant positively related with the return on assets, and the results are consistent with earlier studies of (Zariyawati et al., 2009).

The regression result for Quick ratio (QR) which is a traditional measure of liquidity implies a unit increase in quick ratio is associated with an increase in 6.49 percent and statistically significant.

Size and growth which are considered important indicators of firm performance are generally found to be associated negatively correlated with profitability and statistically insignificant.

The results from regression model specification II are used to determined hypothesis stated in chapter one as shown in 1.4 section. The second research hypothesis mainly tested Inventory holding period of a firm is negatively associated with profitability. In conformity with hypothesis, the indicator of profitability, return on assets is negatively related with inventory holding period but insignificant. Therefore, the null hypothesis is not confirmed and can be concluded that hypothesis two is rejected.

4.4.3 Regression result of model specification III

Model specification III regressed effect of account payable period on ROA.

Model 3: ROAit = β0 + β1 (APPit) + β2 (CRit) + β3 (SGit) + β4 (DRit) + β5 (FSit) + εit

Table 4.8. Regression results of profitability measures and APP

Dependent Variable: ROA
Method: Panel Least Squares
Date: 07/01/17 Time: 12:36
Sample: 2008 2015
Periods included: 8
Cross-sections included: 17
Total panel (balanced) observations: 136

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.185846	0.186561	0.996165	0.321279
APP	0.000611	0.000419	-1.458912	0.147339
FS	-0.000575	0.020521	-0.027998	0.977712
SG	-0.002945	0.003077	-0.957101	0.340541
QR	0.063570	0.021715	2.927476	0.004126
CR	0.006194	0.014840	0.41738	0.000000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.585945	Mean dependent var	0.148529
Adjusted R-squared	0.509672	S.D. dependent var	0.060657
S.E. of regression	0.042474	Akaike info criterion	-3.332763
Sum squared resid	0.205663	Schwarz criterion	-2.861599
Log likelihood	248.627947	Hannan-Quinn criter.	-3.141294
F-statistic	7.682201	Durbin-Watson stat	2.274186
Prob(F-statistic)	0.000000		

Source: E-views output results and authors' computation 2008-2015

Table 4.8 reveals the summary statistics of regression specification II. The explanatory power of the model as can be seen is that the adjusted R squared values are equal to 50.9 percent. This implies that 50.9 percent of the variation in the return on assets can be

Explained by the variables used in the model. The Adjusted R-squared values in this study are found to be enough to infer that the fitted regression line is very close to all of the data points taken together (has more explanatory power). The F statistic is used to test the model

specification. From the table 4.3 the result of one can see that the model is fit with F statistics 7.68 at p-value of 0.0000.

The regression results in table 4.3 indicate that holding other things constant a day increase in accounts payable period is associated with a decrease in 0.0611 percent in profitability but statistically insignificant. Raheman and Nasr (2007), Miftah (2016),Lazaridis and Tryfonidis (2006), Gill *et al* (2010) and Diep (2013) this finding holds that more profitable firms wait longer to pay their bills. This implies that they withhold their payment to suppliers so as to take advantage of the cash available for their working capital needs. Deloof (2003) who found a strong negative relationship between profitability and number of days of account payable justifies in his result that less profitable firms tend to delay payments and more profitable firms pay their bills earlier.

Similarly, except the quick ratio and current ratio, all other variables have insignificant association with firm's profitability. However, quick ratio and current ratio has a positive impact on firm profitability while other control variable like size of the firm and sales growth has a negative Impact on profitability of a firm.

The results from regression model specification III are used to determined hypothesis stated in chapter one as shown in 1.4 section. The third research hypothesis was that the account payable period of a firm are significant positively related to a firm's profitability. In conformity with hypothesis, the indicator of profitability, return on assets are positively related with accounts payable period and insignificant. Therefore, the null hypothesis is not confirmed and can be conclude that hypothesis three is rejected.

4.4.4 Regression result of model specification IV

Model specification IV regressed effect of cash conversion cycle on ROA.

Model 4: ROAit = β0 +β1 (CCCit) + β2 (CRit) + β3 (SGit) + β4 (DRit) + β5 (FSit)+ εit

Table 4.9 Regression results of profitability measures and CCC

Dependent Variable: ROA
Method: Panel Least Squares
Date: 07/01/17 Time: 13:05
Sample: 2008 2015
Periods included: 8
Cross-sections included: 17
Total panel (balanced) observations: 136

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.116639	0.243707	0.478605	0.633135
CCC	-0.000332	0.001393	-0.238389	0.004916
FS	-0.000389	0.020995	-0.018548	0.985233
SG	-0.002893	0.003117	-0.928211	0.355259
QR	0.063906	0.022279	2.868443	0.774916
CR	0.008117	0.015082	0.538198	0.00000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.578425	Mean dependent var	0.148529
Adjusted R-squared	0.500766	S.D. dependent var	0.060657
S.E. of regression	0.042858	Akaike info criterion	-3.314763
Sum squared resid	0.209398	Schwarz criterion	-2.843599
Log likelihood	247.403951	Hannan-Quinn criter.	-3.123294
F-statistic	7.448320	Durbin-Watson stat	2.215298
Prob(F-statistic)	0.000000		

Source: E-views output results and author's computation2008-2014

Table 4.9 reveals the summary statistics of regression specification IV. The explanatory power of the model as can be seen is that the adjusted R squared values are equal to 50.7 percent. This implies that 50.7 percent of the variation in the return on assets can be explained by the variables used in the model. The Adjusted R-squared values in this study are found to be sufficient enough to infer that the fitted regression line is very close to all of the data points taken together (has

more explanatory power). The F statistic is used to test the model specification. From the table 4.9 the result of one can see that the model is fit with F statistics 7.48 at p-value of 0.0000.

The regression results in table 4.9 indicate that holding other things constant a cash conversion cycle period is associated with a decrease in 0.033 percent in profitability and statistically significant at 5%. The combined effect of all the three variables; accounts receivable, inventory holding period and accounts payable period used in model specification IV was analyzed by using cash conversion cycle.

The result indicate that when the net time interval between actual cash expenditures on a firm's purchase of productive resources and the ultimate recovery of cash receipts from product sales shortens by a day, profitability of construction companies in Ethiopia increases by 0.033 percent. Therefore, decreasing the cycle by one day bring an increment of 0.033 percent profit per year on performance of firms. In essence, this negative relationship suggests that corporate managers can increase profitability of their firms by shortening the time lag between a firm's expenditure for purchases of raw materials and the collection of sales of finished goods.

Moreover the regression results show that quick ratio and current ratio have positive correlation coefficient values. However, except CCC variable used in this model are not significant.

Studies like Deloof (2003), Shin and Soenen (1998), Lazaridis and Tryfonidis (2006), Garcia-Teruel and Martinez-Solano (2006), Samiloglu and Demirgunes (2008), Uyar Ali (2009),Tewodros (2010) and Makori and Jagongo (2013) all found a significant negative relation between the CCC and a firm's profitability. Contradicting evidence was found by Gill et al. (2010) who found a positive relation between the two variables. This is caused by the positive, but not significant, relation between inventories and firm's profitability. Also contradicting evidence is found by Sharma and Kumar (2011) in India, who argued that firms, has a higher level of accounts receivable due to generous trade credit policy which results in longer cash conversion cycle.

Considering the components of the cash conversion cycle (i.e., inventory period, accounts receivable period or accounts payable period) the negative result with cash conversion cycle points out that an increase in profitability is associated with a lower in the cash conversion cycle. It shows that the profitable companies tend to have the longer cash conversion cycle which indicates to inefficient working capital management. This was affected by either inventory period, accounts receivable period or accounts payable period. The implication is that the

increase or decrease in cash conversion cycle has significantly and negatively affect profitability of the firms. It means that the shorter the firm's cash conversion cycle, the higher the profitability and vice versa. As stated in theoretical part of this research, cash conversion cycle is an addition of accounts receivable period and inventory holding period and a deduction of accounts payable period. Managing cash conversion cycle efficiently, therefore, means efficient management of these three items. By managing efficiently the accounts receivable period, inventory holding period and accounts payable period (by making short accounts receivable period, inventory holding period and/or long accounts payable period) managers can control the efficiency of cash conversion cycle and its impact on profitability.

The results from regression model specification IV are used to determined hypothesis stated in chapter one as shown in 1.4 section. The fourth research hypothesis was that the cash conversion cycle of a firm is significant negatively related to a firm's profitability. In conformity with hypothesis, the indicator of profitability, return on assets are negatively and significantly related with cash conversion cycle at 5% level. Therefore, the null hypothesis is confirmed and can be conclude that hypothesis four is true.

CHAPTER FIVE

RECOMMENDATION AND CONCLUSION

5.1 Conclusions

The management of working capital is one of the most important financial decisions of a firm. The ability of the firm to operate for longer durations depends on a proper trade-off between management of investment in long-term and short-term funds (working capital).

Firms can achieve optimal management of working capital by making the trade-off between profitability and liquidity. It is necessary for a firm to monitor its working capital properly and maintain its balance at the appropriate level. Shortage of working capital may lead to lack of liquidity as well as loss of production and sales; on the contrary, excess balance of working capital could be seen as loss of investment opportunities.

This research studied the impact of working capital management on profitability of construction companies in Ethiopia. The study used quantitative research approach. Data was analyzed using descriptive statistics and regression analysis on a sample of 17 construction companies in Ethiopia for the period of 2008-2015.

The impact of working capital management has been analyzed by using OLS regression model between WCM and profitability. The study used return on asset as dependent variable. Accounts receivable period, inventory turnover in days and average payment period were used as independent working capital management variables. Moreover, cash conversion cycle was used as comprehensive measures of working capital management. In addition, the study used current ratio, which was used as liquidity indicator; firm size, as measured by logarithm of sales; sales growth rate, as measured by the change in annual sales; and quick ratio as control variables.

Descriptive statistics were used to examine the trend of the chosen variables among the Samples firms. The mean value of the 17 firms included in the study as measured by return on asset was 14.9 percent and it deviates from the mean to both sides by 6.1 percent. Its minimum value is -3 percent while the maximum is 31 percent. While the liquidity position as measured by current ratio is on average 3.6. The firms receive cash collection from their customer on average at 142 days and have accounts payable period on average at 177 days. The average inventory period

that means the period from inventory purchased to inventory sold averaged is 231 days. On the other side, cash conversion cycle as a comprehensive measure of working capital management of construction companies of the study on average takes 142 days. Before the regression were run, the data have tested the assumptions underlying OLS and are fulfilled all tested assumptions made.

The regression analyses of the number of day's accounts receivables indicate that there is a significant negative relation at 5 percent level between these days and firm's profitability. This means that the shorter the firm's accounts receivable period, the higher the profitability and vice versa. Therefore, firms can increase their profitability by reducing the accounts receivable period as much as possible.

The regression analyses of inventory holding period indicate that there is a negative relation between these days and firm's profitability. This means that the shorter the firm's inventory holding period, the higher the profitability and vice versa. Therefore, firms can increase their profitability by reducing the inventory holding period as much as possible. In another way, firms should faster the speed of inventory turnover to maximize profitability.

The regression analyses of account payable period indicate that there is a positive relation between these days and firm's profitability. This means that the longer the firm's accounts payable period, the higher the profitability and vice versa. This can be described as the longer a firm delays its payments to its creditors, can increases profitability.

The regression analyses of cash conversion cycle indicate that there is a significant negative relation at 5percent level between this cycle and firm's profitability. This means that the shorter the firm's cash conversion cycle, the higher the profitability and vice versa. The negative relationship between accounts receivable period and profitability suggests that high profitable firms pursued an increase of their accounts receivables in an attempt to increase their cash gap in the cash conversion cycle.

Similarly, the positive relationship between accounts payable period and profitability shows that when firms delay their payments they earn more profits. The negative relationship between inventory holding period and profitability suggests that firms should make speed the turnover of inventory to be profitable. Therefore, construction firms of Ethiopia can increase their

profitability by making lower the length of cash conversion cycle and keeping each different component (accounts receivables, accounts payables, and inventory) to the optimal level.

5.2 Recommendations

The recommendations of the research were premised on the summary of and conclusions from the results and discussion. The study has shown a clear understanding of working capital components and its impact on profitability of firms. In order to improve firms' performance, management of working capital components is necessary. Therefore, the researcher recommends the following points based on the study findings.

i) The negative relationship between construction firms 'financial performance and accounts receivable period increases firm's profitability when there is high collection of accounts receivable. The researcher further recommended that firms should engage in relationship with those customers who allow short payment period by considering taking into account not to lose customers who delay payments.

ii) The study found negative relationship between inventory holding period and firms' profitability. It is apparent that higher IHP is associated with higher storage, carrying cost and also prone to spoilage. However, as far as previous empirical and theoretical studies concerned minimizing IHP will result in efficient outcome of investment. The researcher recommended the firms should work on in bettering the inventory management system that minimizes the holding period.

iii) 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 also found that cash conversion cycle has a negative relationship with firms' profitability. This means that Investment in working capital could be optimized and cash flows could be improved by reducing the time frame of the physical flow from receipt of raw material to shipment of finished goods, *i.e.* inventory management, and by improving the terms on which firm sells goods as well as receipt of cash.

Finally, management of construction firms made under study can create value for the shareholders as well to make the firms performance well by reducing: the net time interval between actual cash expenditures on a firm's purchase of productive resources and the ultimate recovery of cash receipts from product sales.

5.3 Further Research

This study also recommends that another study should be done to augment the findings in this study; it therefore recommends a study be done on the impact of working capital management on construction firm's profitability in Ethiopia by incorporating other factors.

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