An Impact of Working Capital Management on Profitability of Sugar Manufacturing Factories in Ethiopia (A Study on Selected Sugar Factories)

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doi.org/10.64643/IJIRTV12I12-199878-459

***Abstract*—Working capital plays a vital role in the company's operations and requires the efficient management and it concerns the management of cash, inventories, accounts receivable, and accounts payable. It is necessary for a company to monitor its working capital properly and maintain its balance at the appropriate level. The purpose of the study was to examine the impact of working capital management on profitability of sugar manufacturing factories in Ethiopia. The study used secondary data collected from 4 (four) sugar manufacturing companies covering the period from 2013-2017. The study used explanatory research design also adopted quantitative method of research approaches to test research hypothesis. The dependent variables used in the study was Return on asset (ROA) and while the independent variables were Cash conversion period (CCP), Account receivable period (ARP), Account payable period (APP), and Inventory conversion period (ICP) for measurements of working capital management, also the control variables used in the study were Current ratio (CR) as a measure of liquidity, Debit ratio (DR) for a measure of firm leverage, Firm size (FS) measured by natural logarithm of sales and Firm growth rate (FGR) which is measured by changing in annual sales value with reference to previous year's sales. The data were run using SPSS (version 20) and STATA (version 12) then analysis was made through descriptive statistics, Pearson correlation, and OLS regression. Using panel data, the study found that account payable period has a significant negative impact on profitability while account receivable period has a significant positive impact on profitability. More over the study found that there is significant negative impact of size on firm profitability. Furthermore, the study found that Cash conversion period, Inventory conversion period, Firm growth rate have insignificance positive impact on company's profitability. Furthermore, insignificance negative impact of Debt ratio and current ratio on profitability was found. Based on the key findings from the study it has been suggested that the management of a firm can increase profitability by increasing the number of day's accounts receivable by implementing applicable collection policy for the sector and decreasing account payable period from this action the firm can benefit from discount and will have a worthy relation with the suppliers for future transaction.**

***Index Terms*—working capital, sugar factory, management, profitability**

I. INTRODUCTION

According to Paramasivan and Subramanian (2008), capital is divided into two major headings fixed and working capital. Fixed capital means that capital, which is used for long-term investment of the business concern. For example, purchase of permanent assets, normally it consists of non-recurring in nature. Working capital is another part of the capital which is needed for meeting day to day requirement of the business concern. For example, payment to creditors, salary paid to workers, purchase of raw materials etc., normally it consists of recurring in nature. It can be easily converted into cash. Hence, it is also known as short-term capital.

Makori and Jagongo (2013), define working capital as life giving force for any economic unit and its management is considered among the most important function of corporate management and it is regard as the lifeblood of a firm (Padachi, 2008). Every

organization, whether profit oriented or not, irrespective of size and nature of business, requires necessary amount of working capital. However, the working capital of the firms has to be managed effectively in order to operate the typical firm smoothly this is why Brigham and Houston (2003) stated that about 60% of a typical financial manager's time is devoted to working capital Management and about 50% of the typical industrial or retail firm's assets are held as working capital (Brigham & Houston, 2008). On the other hand, the direct impact of working capital is not only on the cash position and the troubles it may cause to financial managers, but it rather affects the company's profits in a more direct way. This direct impact stems from the need of the company to borrow to finance the working capital requirements and cash gaps (Eljelly, 2004).

According to Filbeck and Krueger (2005), working capital management is an act of planning, organizing, and controlling the components of working capital like cash, bank balance inventory, receivables, payables, overdraft, and short-term loans. The objective of working capital management is to maintain the optimum balance of each of the working capital components namely cash, bank balance, marketable securities, receivables, inventory, and payable. Effective working capital management is very important due to its significant impact on profitability of company and thus the existence of company in the market (Hina, 2014). Efficient utilization of the firm's resources, as it relates to working capital management, means that executives should find effective and efficient ways to deal with the cash available for the day- to-day operations in order to achieve the optimum effect. Good working capital management leads to increased cash flows, and thus leads to lesser need on external financing; therefore, the probability of default for the firm is reduced (Deloof, 2003).

According to Raheman and Nasr (2007), the ultimate objective of any firm may be to maximize the profit. But, preserving liquidity of the firm is an important objective too. The problem is that increasing profits at the cost of liquidity can bring serious problems to the firm. Therefore, there must be a tradeoff between these two objectives of the firms. One objective should not be at cost of the other because both have their importance. If the company does not care about profit, it cannot continue for a longer period. On the other hand, if the company does not care about liquidity, it may face the problem of insolvency or bankruptcy; therefore, companies can increase profitability and maintain adequate liquidity by giving proper consideration to effective management of working capital.

According to Deloof (2003), the way in which working capital managed will have a significant impact on the profitability of firms. Accordingly, for many firms' working capital management is a very important component of financial management on the company performance also on their day-to-day operation, from this its unavoidable to done study on this area beside there is limited study done in Ethiopia. Generally, the objective of this study was to examine the impact of working capital management on sugar manufacturing factories' profitability in Ethiopia.

- Sugar Manufacturing Factories in Ethiopia

Sugar industry profile was at wonji in 1951 some 110 km east of the capital Addis Ababa at modern sugar industry stated in Ethiopia as a share company established by foreign privet investors & Ethiopian government. By then the Netherlands H.V.A. company had entered into the sectors as a foreign share holder. When the factory started production in 1954 its initial production was one thousand four hundred quintals of sugar a year. At the start, the share company had five thousand hectares of land for its sugar cane cultivation. As its location is one of the most suitable areas of the world to the sector it opened a door to Wonji candy factory to come forward. Then followed by Showa sugar factory in 1962 with 1,700 quintals of sugar production capacity a day. The two factories known by the name wonji shoa sugar factory altogether had the capacity of producing 750,000 quintals of sugar per annum till recent time i.e. pioneer to the completion of the new wonjishoa sugar factory. Serving for more than half a century and getting obsolete, these two wonji and shoa sugar factories were closed in 2011 and 2012 respectively. Replacing these pioneer factories, the new and modern factory had started production in 2013 with higher production capacity.

The second factory is metehara sugar factory is established as a share company between same Netherlands Company and the Ethiopian government in 1965 and started production in 1969 at a location

known as Mertti some 200 km far from Addis Abeba. Currently, a total 10,235 hectares of sugarcane cultivation land has a capacity of producing more than 1.3 million quintals sugar and 12.5 million liters ethanol a year on average.

Five years after the establishment of metehara sugar factory i.e in 1974 following the dawn fall of the Emperors regime all sugar factories were made to e administered under the ownership of the government and started operating under the Ethiopian sugar corporation. The corporation had also been made to administer the Addis Ketema and Asmera candy factories together with the above mentioned three sugar factories.

Fincha sugar factory as the third sugarcane crushing mill to the nation came in to existence in late 1998 though its establishment process and other activities dated back to 1975. The gap between the establishment and commencement of production of the factory is mainly occurred due to the political change the nation had undergone. Its finance sources were African Development Bank and Development Fund, Governments of Australia and Spain as well as domestic banks of the nations.

Its initial sugar production was 500,000 quintals per annum. More modern than the former factories the factories construction jobs including its ethanol plant was executed by American company known as F.C. shefer and Associates and Netherlands company called Dewetto international while many domestic construction companies had also played their part in the process.

In 2006, Tendaho sugar Development project was established as a fourth two- phased project in the country. Construction of the first phase factory has started production in 2015.

The two-phase project, reaching its maximum crashing capacity, eventually enables the factory produces 3 million quintals of sugar and 30 million litters ethanol a year. The factory, phase factory construction finalized, has started producing sugar. The factory will in total have 50,000 hectares of sugarcane cultivation land.

It was during the inception of Tendaho sugar factory that the Ethiopian sugar development agency came into existence replacing the support center to assist the sugar factories in project development, research and training.

The sugar sub-sector is mainly disbursed in all most all regional state of Ethiopia except Somale, Gambela, Benishangulgumuz and Harari regional states. These include 4 from Oromiya region, 4 from south regional state around Omo River, 2 from afar region, 2 from Amahara region, and 1 from Tigray region. In 1951 the government established wonji sugar factory by foreign investors & Ethiopian government as a share company. Currently wonji sugar factory is closed. Then followed wonji Shoa Sugar Factory in 2012 and the second phase in 2013, Metahara in 1965, under the ownership of the government and started operating under the Ethiopian Sugar Corporation. Fincha sugar factory in Oromiya region states in Horro Guderru Wellega Zone in 1978, Tendaho Sugar factory found at the lower Awash basin of Afar regional state around Dubti, Assaita and Affambo districts. Established in 2006, Kessem sugar factory is established in 2011 found at Zone three in Awash Fentale and Dulecha woreda of Afar regional states, Arjo Dedesa sugar factory is established in 2012 and found in East Wellega, Ellu ababora and Jimma zones at the Dedesa Rift valley of Oromiya regional state, OmoKuraz sugar project 1 in 2012, Omo Kuraz sugar project 2 in 2015, Omo Kuraz sugar project 3 in 2012, Omo Kuraz sugar project 5 in 2016, Tana belels 1 and 2 sugar project is mainly found in Amhara regional states established in 2011 and finally Wolkayit sugar project is found in the Western Zone of Tigray regional state established in 2013.

The performance of the sugar industry has continued to be quite dismal. Ethiopia therefore continues to live off its legacy of being self-sufficient in terms of sugar production. Generally, sugar industry is one of the largest agro-based processing industries in Ethiopia and plays a significant role in the socioeconomic development of the country. Currently, the Ethiopian Sugar Corporation (ESC), the only sugar sector role player and a catalyst for the country's economic development including energy supply, job creation and tax revenue, is working hard to strategically manage all sugar manufacturing factories that are accountable to it. Up to 2019 the sugar corporation has 13 sugar development projects and factories in the different parts of the country.

Table: 1.1 Sugar factories profile

S. No	Factories Name	Production starting years	Crushing capacity Per day (TCD)	Region found	Total Cultivation Land
1	Wonji sugar factory	2013	10,000 tones	Oromiya	11,500 hector
2	Metehara sugar factory	1970	5,372 tones	Oromiya	10,230 hector
3	Fincha sugar factory	1978	12,000 tones	Oromiya	19,460 hector
4	Tendaho sugar factory	2013	13,000 tones	Afar	41,176 hector
5	Kessem sugar factory	2013	10,000 tones	Afar	20,000 hector
6	Arjo sugar factory	2015	8,000 tones	Oromiya	14,499 hector
7	OmoKuraz Sugar V	Project	24,000 tones	SNNPR	40,000 hector
8	Tana belles project II	Project	12,000 tones	Amhara	20,000 hector
9	Wolkayit sugar project	Project	24,000 tones	Tigray	40,000 hector
10	Tana belles project 1	Project	12,000 tones	Amhara	20,000 hector
11	Omokuraz sugar Factory II	2017	12,000 tones	SNNPR	20,000 hector
12	Omokuraz III	2018	12,000 tones	SNNPR	20,000 hector
13	Omokuraz project I	Project	12,000 tones	SNNPR	20,000 hector

Source: - from Ethiopian sugar industry profile, of January 2025

Table 1.2 selected sugar factories

S. No	Factories Name	Production starting years	Crushing capacity Per day (TCD	Region found	Total Cultivation Land
1	Wonjishoa sugar factory	2013	10,000 tones	Oromiya	11,500 hector
2	Metehara sugar factory	1965	5,372 tones	Oromiya	10,230 hector
3	Tendaho sugar factory	2013	13,000 tones	Afar region	41,176 hector
4	Kessem sugar factory	2013	10,000 tones	Afar region	20,000 hector

Source: - from Ethiopian sugar industry profile, of January 2018 and also from Internet on Ethiopian Sugar Corporation profile.

1.2 Statement of the problem

As Javid and Zita (2014) states working capital management is ability of financial managers to effectively and efficiently manage their cash, receivables, inventories, and payables; this component

have a significant impact on profitability and on the success of the business as well. Most of the time, liquidity goals of a firm is to have adequate cash to pay for its bills, to make large unexpected purchases and finally, firm has an adequate cash reserve to meet emergencies in all time. Whereas, profitability goal on the other hand requires that, funds of a firm are used so as to yield higher returns. Therefore, when one increases, the other decreases (Brigham & Houston, 2003), also Van Horne and Wachowicz (2004) pointed out that excessive level of current assets have a negative impact on firm's profitability, while lower level of current assets lead to lower liquidity and stock outs, and result in difficulties of maintaining smooth operations. From this it is worthwhile to have effective working capital management within the company.

Regarding to researches on the impact of working capital management on profitability Hassan (2010) described that lots of research has been carried out all over the world especially in developing countries like Pakistan, India, and Taiwan etc. although Abera (2010) states on his study that in Ethiopia research studies on working capital management on profitability remained an ignored area of empirical research.

The impact of Working capital management on profitability has been studied significantly by different researchers (Karaduman, 2004; Abera, 2007; Akbasand Ozsozgun, 2010; Soekhoe,

2012; Arunkumar and Radha, 2013; Kaur and Singh, 2012; Rehman, 2013; Ebenezer and Asiedu, 2013; Akoto, VitorandAngmor, 2013; Hina, 2014; and Mengesha, 2014). Most of this and other researchers identify there is a significance impact of working capital management on profitability. But still, there are inconsistencies between the findings of some researchers. For instance, the study conducted by (Deloof, 2003; Mekonnen, 2011; Raheman and Nasr 2007; Karaduman; Akbas and Ozsozgun, 2010; Mengesha, 2014 and Mohammed, 2011) found that account receivable period, account payable period, inventory conversion period has negative impact on firm's profitability. Other researchers like Mathuva (2011) and Muoki (2013) found that profitability has positively impacted by average collection period and average payment period.

Therefore, based on the absence of clear-cut direction of impact between any of the variables of working capital management on firms' profitability as indicated in previous studies the researcher need to examine the impacts of working capital management on profitability of sugar manufacturing factories in Ethiopia, (this section further discussed on the literature review part).

Moreover, most studies concentrated on large firms operating within well-developed money and capital markets of developed economies. From such findings it is difficult to generalize for relatively under developed country like Ethiopia and specifically to the sugar manufacturing factories. To the best knowledge of the researcher while searching on internet and looking journals the researcher didn't find directly related to research topics carried out in Ethiopia.

Though, there are a few studies with reference to Ethiopia on working capital management and firm profitability, For example, Abera (2007)focused on the effect of working capital investment and financing policies on firms' profitability by using audited financial statements of a sample of 11 manufacturing private limited companies in Tigray region, for the period of 2005 to 2009.Mekonnen (2011) on the other hand, examined the impact of working capital management on profitability for a sample of thirteen (13) companies in Addis Ababa, for the period of five years (2005-2009). Furthermore, Vallalnathan and Joriye, (2012) investigated the impact of working capital management on the profitability of cooperative unions in East Showa, Ethiopia For eight sample cooperative unions in East Showa, Ethiopia for the period of five-year from1999-2003 Ethiopian Calendar(E.C.). Finally, Mengesha (2014) examined the impact of working capital management on firm's performance by using audited financial statements of a sample of 11 metal manufacturing private limited companies in Addis Ababa, Ethiopia for the period of 2008 to 2012. However, these studies provide limited evidence on the impacts of working capital management on profitability of sugar manufacturing companies in Ethiopia. Generally, this study contributes to the literature on the impact of the working capital management on firm's profitability in at least three ways. First, it focuses on sugar manufacturing companies in Ethiopia where no research has been conducted. Second, this study confirms some of the finding of previous authors by examining the impact s of working capital management on profitability of sugar manufacturing factories in Ethiopia. Thus, this study adds ingredient

to the existing theory developed by previous authors perhaps there is no consensus on the nature of the effect of different empirical results therefore; this study seeks to contribute to this empirical research gap. Third most studies conduct 5-10 years financial statement unlike to other studies this study conducted based on 5 years of financial statement.

The efficient management of working capital is very vital for a business survival. This is premised on the fact that having too much capital signifies inefficiency where as too little cash in hand signifies that the survival of the business is shaky. As of most sugar manufacturing factories in Ethiopia, the selected sugar factories common problems are lack of efficient management of their cash, account receivables, inventories, and account payables; Due to this reason the factories are unable to meet there maturing short term obligations and its upcoming operational needs. Lack of adequate working capital also means that a firm is unable to undertake expansion projects and increase its sales.

Working capital management and management of sugar manufacturing firms in Ethiopia have been encountering cash constraints and WCM challenges such as failure to meet their operational needs i.e. selected sugar manufacturing factories in Ethiopia have exhibited dwindling returns as well as poor performance in the last several years. And also failure to pay their workers' salaries in time and other operational requirements and thus reduced productivity through strikes and go slows which generally affects factories performance and profitability (ESC Report, 2010). It is on these facts that the study intends to find possible road maps to addressing the impact of WCM challenges on profitability of 4 (four) selected sugar manufacturing factories in Ethiopia. However, the extent to which working capital management affects profitability of these factories is not well known. It is on this premise that this study wills analysis the relationship between working capital management and the factories' operating profit (ESC Report, 2010).

1.3 Objectives of the study

1.3.1 General Objective

The general objective of this study was to examine the impact of working capital management on the profitability of four selected sugar manufacturing factories in Ethiopia over a period of five years.

1.3.2 Specific Objective

This study has the following specific objectives.

1.Average profitability of Sugar manufacturing factories in selected sugar factories.

2. Analyze the working capital management of selected sugar factories.

3. Inventories turnover in days and profitability of Sugar manufacturing factories in Ethiopia

1.4 Research Questions

1. What is other method of debt payments than payment out of cash?
2. What working capital management is being practiced in sugar manufacturing companies?
3. Are there the limitations and shortfalls being faced in the practice of working capital management in sugar manufacturing companies?
4. Is working capital management in sugar manufacturing factories important?

II. RESEARCH METHODOLOGY

2.1. Research design and approach

According to Kothari (2004) a research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure, To achieve the objective of this study, Explanatory research design was adopted Saunders, Lewis, and Thornhill (2007) suggest an explanatory study type of research design for those researches that establish cause and effect relationship between variables. Therefore, since this study examines the impact of working capital management on profitability it is an appropriate design. Besides, this study uses quantitative research approach to examine a stated objective. According to Kothari (2004) quantitative research approach involves the generation of data in quantitative form which can be subjected to quantitative analysis in a formal and rigid fashion.

2.2. Target Population

Target populations of the study here would be the employees of those four (4) selected sugar factories. Which include, Tendaho sugar factory, Kessem sugar factory, Wonji sugar factory and Matahara sugar factory are the targeted population because they involved particularly in the working capital management of their factories.

2.3. Sampling Design Procedures and Sample Size Determination

The study used four sugar manufacturing factories in the country as the study area with a total number of over 50,000 employees. Here the employees of those four (4) selected sugar factories. Which include, Tendaho sugar factory, Kessem sugar factory, Wonji sugar factory and Matahara sugar factory. The data is collected from finance division of selected factories. The finance division of all selected factories is 196. But here take in to consideration that sample size is only from finance Divisions General accounts team and Cost and budget team only which includes an employee over Supervisor position to finance division deputy general manager because of they are expected to know working capital management or audited financial reports of the factories.

2.3. Sample Technique

The researcher used in this study to investigate on the impact of WCM components and WCM towards the profitability of factories, non-probability sampling technique has been adopted in view that the selection of the elements in the population as sample have unknown probability and no pre-arranged opportunity of being selected, which one of the non-probability designs refers to purposive sampling (Sekaran and Bougie, 2010).Purposive sampling refers to anon-probabilitysamplethatcorrespondstospecificcriterionstipulated,wherebyoneofthe types is known as judgment sampling(Cooper and Schindler,2006;SekaranandBougie,2010).

Therefore, in this study, judgment sampling has been applied due to the sample is selected based on certain criteria that had been identified as per the section on data collection method, such as the sample of companies selected must be continuously listed.

2.4. Source of Data

The source of data used for this study was obtain from secondary data source from four selected sugar factories listed in Ethiopia controlled under Ethiopian Sugar Corporation. The period of study selected is for five years period, from year 2013 to 2017 G.C.

The source for this secondary data is derived from the following sources: -

1. The selected four Factories Audited Financial reports
2. The Ethiopian sugar corporation website
3. The Developmental Bank of Ethiopia website
4. The Ministry of Finance and Economic Corporation Report of Ethiopia website

2.5. Methods of Data Collection

To achieve the objective the study uses panel data of sugar manufacturing factories for five years from 2013-2017. Panel data which combine the features of both time series and cross-sectional data. According to Shah and Khan (2007), panel data follows a given sample of individuals over time, and thus provides multiple observations on each individual in the sample. They also noted that panel data provides information on a number of statistical units for a number of years. Furthermore, they noted that “panel data usually provides the researcher a large number of data points, increasing the degree of freedom and reducing the collinaerity among explanatory variables and therefore, it improves the efficiency of econometric efficiency”. Also, according to Brooks (2008), the major benefits of using penal data is, more useful in studying the dynamics of adjustment, and it is better able to identify and measure impacts that are simply not detectable in pure cross-sections or pure time series data. Moreover, many variables can be more accurately measured at the micro level and biases resulting from aggregation over firms or individuals are eliminated.

Accordingly, the study use secondary sources of data. According to Zikmund (2003), Secondary data means data that gathered and recorded by someone else prior to the current need of the researchers. Secondary data was obtained from audited financial statements, i.e. balance sheet and income statement of the companies and the data was collected from each sugar manufacturing companies.

2.6. Methods of data Analysis

As noted by Kothari (2004) data has to be analyzed in line with the purpose of the research plan after data collection. Accordingly, secondary data will analyze to determine its suitability, reliability, adequacy, and accuracy. Analysis of data was undertaken to show the effects of explanatory variables in the dependent variable. Data analysis was carry out based on descriptive analysis, correlation analysis and regression analysis.

The descriptive statistics explores and present an

overview of all variables used in the analysis. Mean, minimum, maximum, and standard deviation values were used to analyze the general trends of the data from 2013 to 2017 for the variables which included in the study.

The Pearson correlation analysis shows how variables are related with each other. The results of this analysis represent the direction of the correlation of the variables.

The linear regression analysis was used to examine the impacts of explanatory variables on the profitability of Ethiopian sugar manufacturing companies. According to Brooks (2008) Regression is concerned with describing and evaluating the relationship between a given variable and one or more other variables.

Then the collected data was processed and run using SPSS 20 & STATA 12 to be able to analyze and interpret. The output generated by this software was presented by different tools.

2.7. Description of Variables

To examine the impacts of working capital management on the sugar factory's profitability the researcher specify some variables that indicate working capital management and profitability. These variables divided in to dependent variable, independent variable, and control variable.

2.8.1. Dependent Variable

The profitability is the dependent variable and was measured by the Return on asset (ROA).

 Return on asset

The study was taking ROA as dependent variable. It is attempting to measure the overall return the firm is generating on the amount of money invested in its assets (Brigham & Houston, 2008).The reason for choosing this variable is that the ROA represents the ratio of how much firm has earned on its asset base (Melicher & Leach, 2009) and It indicates how effectively the assets are managed to generate revenue besides profitability is best measured by ROA (Tan et al. as cited in Abebe, 2014) and according to Padachi (2006) ROA is a better measure since it relates the profitability of the company to the asset base. ROA has been used as dependent variable by Karaduman et al, 2004;Teruel and Solano, 2007; Padachi, 2006;Abera, 2010; Kaddumiand Ramadan, 2010;Karaduman, Akbas, &Ozsozgun, 2010; Soekhoe, 2012; Arunkumar and Ramanan, 2013; Makori, 2013; and Hina, 2014.To establish a true relationship between the operating "success" or "failure" of firms and working capital policies and to avoid the effect of tax incentives (if available), Earning before Interest and Tax (EBIT) was used as a base to calculate return on assets, (Abera, 2010; Teruel& Solano, 2007;Mengesha, 2014; and Makori, 2013).

2.8.2 Independent variable

The working capital measure by the Cash conversion period (CCP), Accounts receivable period (ARP), inventory conversion period (ICP) and accounts payable period (APP).

 Cash conversion period (CCP)

The cash conversion period is a popular measure of the working capital management. It measures the number of days in average between the purchases of raw material until the firm receives money for their finished sold product (Deloof, 2003). The reason to choose the CCP is because, according to Tereul and Solano (2007), the decision of how much to invest in customer and inventory accounts, and how much credit to accept from suppliers are reflected in the CCP.

This measure is determined by the following equation

CCC = Number of days Accounts Receivable + Number of days Inventory –Number of days Accounts Payable

CCC = ARD + INV – AP

Accounts receivable period (ARP)

Also called the "average collection period" (ACP) is used to appraise accounts receivable, and it is calculated by dividing accounts receivable by average daily sales to find the number of days' sales that are tied up in receivables. Thus, the average collection period represents the average length of time that the firm must wait after making a sale before receiving cash, which is the average collection period (Brigham &Houston, 2008).

$$ARD = \frac{\text{Accounts Receivable} \times 365 \text{ days}}{\text{Sales}}$$

Inventory conversion period (ICP)

Also called Average number of days inventory. Inventory conversion period tells how quickly, on average, inventory goes from being purchased to being sold. This calculation is important because it helps a

business owner understand how quickly needs to purchase new inventory. It is also important because it is part of the cash conversion cycle. Inventory conversion period calculated by dividing inventory to cost of goods sold per day (Brigham& Houston, 2009).

$$INV = \frac{\text{Inventory}}{\text{Cost of Goods Sold}} \times 365 \text{ days}$$

Accounts payable period (APP)

Accounts payable payment period measures the average number of days it takes an entity to pay its suppliers also examines the relationship between credit purchases and payments for them. To calculate this ratio, the average accounts payable are divided by the average daily cost of sales in the period. The average cost of sales can be determined by dividing the cost of sales for the period (e.g., a year) by the number of days in the period (Brigham & Houston, 2008)

$$A P = \frac{\text{Accounts Payable} \times 365 \text{ days}}{\text{Cost of Goods Sold}}$$

The control variables

Other variables besides the independent and the dependent variables that may have impact on the profitability of affirm are the control variables such as Current ratio, Debt ratio, Firm growth rate, and firm size. The reason for choosing these variables is because they are inherent firms characteristics which can also affect company profitability in addition to the effects of independent variables and the other reason is that most of researchers (Deloof, 2003;Teruel & Solano,2007;Nazir&Afza,2009;Raheman &Nasr,2007;and Shin & Soenen, 1998) have used these to calculate the impact of WCM on profitability in various areas. Further described as follows

Current ratio

Which is a traditional measure of liquidity is calculated by dividing current assets by current liabilities (Raheman & Nasr, 2007).

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$$CR = \frac{\text{Current Asset}}{\text{Current Liability}}$$

Debt ratio (Leverage)

Debt Ratio (leverage) shows the how much of the firm's assets is financed by external debt. In case the financial charges due to external financing is larger than the earnings before interest and taxes, the firm can incur great losses (Soekhoe, 2012). Debt ratio is one part of financial ratio which is used for debt management used by different company. Hence, it is ratio that indicates what proportion of debt a company has relative to its assets. The measure gives an idea to the leverage of the company along with the potential risks the company faces in terms of its debt-load (Fabozzi & Peterson, 2003). To keep the debt utilization effect constant debt to asset ratio is taken as control variable; it is calculated by dividing total debt by total assets.

Total Debt

$$\text{Debt Ratio} = \frac{}{\text{Total Asset}}$$

Firm Size

On Eljelly (2004) study the size variable is also found to have significant effect on profitability at the industry level. The firm size will be determined by the natural logarithm of sales. Researchers

who have used this variable as control variable on their study are:(Deloof,2003; Karadumanet al 2004; and Soekhoe, 2012).

Firm Growth Rate (FGR)

The firm growth rate is measured by variation in its annual sales value with reference to previous year's sales [(Sales–Salest–1)/Sales t–1] (Afza&Nazir,2009). Firm growth rate used as a control variable by different researchers, (Deloof, 2003; Teruel and Solano, 2007; and Padachi, 2006).

2.8. Model Specification

Since the study seeks to examine the impacts of working capital management on profitability of sugar manufacturing factories in Ethiopia over five-year period, the study uses panel data regression analysis of cross-sectional and time series data. The impact of working capital management on manufacturing factories was estimated by using similar quantitative models of Delof (2003); Raheman and Nasr (2007);Senand Oruc(2009); and Kaddumi and Ramadan (2010). The general formula used for the model is:

$$Yi = \beta 0 + \sum \beta i xi + Ei$$

Where

Yi are the i^{th} observation of dependent variable (ROA)

B_O is the intercept of equation

β_i arecoefficients of Xi variables

X_i is the different independent variables t is Time from 1, 2…, 5years

ε_i is the error term

When the above general model converted to each variable the following equation will be create

Cash conversion period and profitability measures (MODEL1)

$ROA_i=\beta_0+\beta_1(CCP_i)+\beta_2(CR)+\beta_3(DR)+\beta_4(FS)+\beta_5(FGR)+\varepsilon$ (1)

Account receivable period and profitability measures (MODEL2)

$ROA_i=\beta_0+\beta_1(ARP_i)+\beta_2(CR)+\beta_3(DR)+\beta_4(FS)+\beta_5(FGR)+\varepsilon$ (2)

Inventory conversion period and profitability measures (MODEL3)

$ROA_i=\beta_0+\beta_1(ICP_i)+\beta_2(CR)+\beta_3(DR)+\beta_4(FS)+\beta_5(FGR)+\varepsilon$ … (3)

Account payable period and profitability measures (MODEL4)

$ROA_i=\beta_0+\beta_1(APP_i)+\beta_2(CR)+\beta_3(DR)+\beta_4(FS)+\beta_5(FGR)+\varepsilon$. (4)

Where

ROA=Return on asset CCP=Cash conversion period ARP= Account receivable period ICP=Inventory conversion period APP=Account payable period

CR= Current ratio DR= Debt ratio

FS= Firm size

FGR=Firm growth rate

ε=Error term

III. DATAANALYSIS, PRESENTATION AND DISCUSSIONS

This section deals with the presentation of the results and analysis of the study. The data were run by using SPSS software version 20 and STATA version12. First the descriptive statistics and the correlation analysis were discussed then followed by the diagnostic test, which is necessary to fulfill the assumption of the classical linear regression model. Then, econometric analysis and discussion of the main finding of the study were presented. Finally, the results of the regression analysis were discussed by supporting empirical evidence and the hypothesis tested.

a. Working capital management practiced in sugar manufacturing factories?

Working capital ratios indicates the ability of a business concern in meeting its current obligations as well as its efficiency in managing the current assets for generation of sales. These ratios are applied to evaluate the efficiency with which the firm manages and utilize its current assets. The following three categories of ratios have been to analyze management of working capital.

1. Efficiency ratios
2. Liquidity Ratios
3. Structural Health ratios.

Efficiency Ratios

(i) Working capital to sales Ratios = $\frac{\text{Sales}}{\text{Working Capital}}$

This ratio is computed by dividing working capital by sales. This ratio helps to measure the efficiency of the utilization of new working capital. It signified that for an amount of sales, a relative amount of working capital is needed. If any increase in sales is contemplated working capital should be adequate and thus this ratio helps management to maintain the adequate level of working capital.

Table 4:1 Working capital to sales ratio

Years	Factories			
	Tendaho	Wonji	Metahara	Kessem
2013	1.26	1.72	1.99	1.13
2014	2.91	2.04	9.39	1.97
2015	0.91	1.10	3.12	0.66
2016	1.17	1.40	1.95	2.92
2017	1.96	20.84	2.68	1.39
Total	8.21	27.1	19.13	8.07
Average	1.642	5.42	3.826	1.614

Source- Computed by researcher from annual reports of the company.

3.1. Descriptive Statistics

This section presents the descriptive statistics of dependent, independent variables, and control variables used in the study for the sugar manufacturing factories. The dependent variables used in the study

was ROA and while the independent variables were Cash conversion period (CCP), Account receivable period (ARP), Account payable period (APP), Inventory conversion period (ICP), and the control variables are Current ratio(CR), Debit ratio (DR), Firm size (FS) and Firm growth rate (FGR). Thus, the total observation for each variable was 48 (panel data of 4 sugar manufacturing factories for 5years). Descriptive analysis shows the average, and standard deviation of the different variables of interest in the study. It also presents the minimum and maximum values of the variables which help in getting a picture about the maximum and minimum values a variable can achieve.

3.2. Descriptive statistics result interpretation for dependent variable

The ROA has a mean value of. 0480. This indicates that the sugar factories on average earned a net income of.0480 from its total asset and it also deviate by .15898. It means that value of profitability can deviate from mean to both sides by. 15898.The maximum value of ROA was 48 And minimum value of -.22. That means, the most profitable companies earned. 48cent of net income for a single birr invested in the assets of the firm. On the other hand, the least profitable companies incurred .22 cents of loss for each birr investment in the assets of the firm.

3.2.1. Descriptive statistics result interpretation for independent variable

Regarding the independent variables the descriptive statistics for the four measures of efficiency of working capital management, namely, Cash conversion period, Account receivable period, Account payable period, Inventory conversion period are also presented in the same table.

Accounts receivable period, a measurement for collection policy, is averaged to187 days. The interpretation for the average of the account receivable period is that, firms in the sample wait187 days on average to collect cash from credit sales. The Account receivable period can vary by 185 to both sides of the mean value. The minimum and the maximum Account receivable period for the sampled firms are 17and 594 days respectively. On the other hand, the Accounts payable payment period measures the average number of days it takes an entity to pay its suppliers has a mean value of 238 and deviate from the mean by 229.The minimum day of account payableis-26 and has a maximum day of 969. The other independent variable used in the study was the inventory conversion period which is a measure of days of inventory wait until its sales. From the descriptive result the sugar manufacturing factories' wait an average of 404 days and deviate by 249 from the mean value. Also the inventory collection period has a minimum value of-485 and maximum value of 904. On the other hand, the cash conversion period measured by adding account receivable period to inventory conversion period then subtract account payable period has an average value of 148 and standard deviation of 394.Also has a minimum value of-761 and maximum value of 985.

3.2.2. Descriptive statistics result interpretation for control variable

Regarding the control variables, the first one is debt ratio it shows that how much of the firm's assets is financed by external debt from the study of sugar manufacturing factories have an average value of .4922 this means sugar factories in Ethiopia on average 49% of finance there asset by external debt. The debt ratio has minimum value of.03 and maximum value of.86 and standard deviation of .21106. The other control variable used as a measure of liquidity in the study is current ratio. Current ratio measured by dividing current asset by current liability has the mean value of 1.4638 and deviate from the mean from both sides by.64750.

In addition, the above table also includes the descriptive statistics of firm size measured by natural logarithm of sales. The mean value of natural log of sales is 20.1575 while the standard

deviation is .56791 and The maximum value of natural of sales for a company is 21.14 and the minimum is 18.96. The last control variable of the study is firm growth rate and from the result sugar manufacturing factories have.1576 means value and standard deviation of .30130.-.4 6 is the minimum value and 1.24 is the maximum value of firm growth rate in Ethiopia sugar factories.

Table4:2 Summary of Descriptive statistics

	Minimum	Maximum	Mean	Std. Deviation
ROA	-0.22	0.48	0.048	0.15898
CCP	-761	985	148.09	394.063
ARP	17	594	187.57	185.571
ICP	48	904	403.94	248.855
APP	26	969	238.4	228.897
DR	0.03	0.86	0.4922	0.21106
CR	0.38	3.47	1.4638	0.6475
FGR	0.46	1.24	0.1576	0.3013
FS	18.96	21.14	20.157	0.56791

Source: SPSS output Based on Annual report of factories from 2020-2025

3.3. Correlation Analysis

One of the measures used to identify the degree of linear association between variables is Pears on correlation. Values of the correlation coefficient are always ranged between + 1 and -1. A correlation coefficient of +1 indicates that the existence of a perfect positive association between the two variables; while a correlation coefficient of -1 indicates perfect negative association. A correlation coefficient of zero, on the other hand, indicates the absence of relationship (association) between two variables (Brooks, 2008). In this study, the researcher employed the Pears on product moment of correlation coefficient in order to find the association of the variables with the profitability of sugar manufacturing factories in Ethiopia.Based on the table 4.2, account payable, debt ratio, current ratio and firm size have negative relation with a coefficient of -.299, -.054, -.076, and -.440 respectively with return on asset. This correlation shows as account receivable period, account payable period, debt ratio, Current ratio, and firm size increase by 100% the profitability of the company will decrease by 30%, 5%, 8%, and44%respectively. On the other hand cash conversion period, account receivable period, inventory conversion period and firm growth rate have positive relation with Return on asset by a correlation coefficient of .058,.309,.055 and.150 respectively. This means when the cash conversion period, account receivable and firm growth rate increase by 100%the profitability of sugar manufacturing companies increases by 6%,31%, 5% and 15% respectively.

Table 4:3 Pearson correlation coefficient matrixes for ROA Correlations

	ROA		CCP	ARP	ICP	APP	DR	CR	FGR	FS
ROA		1	0.058	0.309	0.055	-0.299	-0.054	-0.076	0.15	-0.44
CCP			1	0.13	0.556	-0.453	-0.385	0.357	-0.152	0.159
ARP				1	-0.125	-0.069	0.195	-0.073	-0.004	0.301
ICP					1	0.075	-0.068	0.271	-0.123	-0.111
APP						1	0.551	-0.421	0.124	-0.113
DR							1	-0.731	0.082	-0.074
CR								1	-0.243	0.21
FGR									1	0.099
F										1

Source: SPSS output Based on Annual report of factories from 2020-2025

3.4. Testing Assumptions of classical Linear Regression Model (CLM)

Before the regressions were run tests for fulfillment of basic CLRM assumptions are tested. In order to draw correct estimation, using regression model to analyze the data requires certain assumptions to be fulfilled. Under this subsection, the study presented five different results for the tests of CLRM such as tests of

normality assumption, tests for multicollinearity, tests for the assumption that error has zero mean, tests for homoscedasticity, and tests for the absence of autocorrelation.

3.4.1. Normality test

In this study to check whether the normality test was adequately meet, the histogram was used. If the residuals are normally distributed, the histogram should be bell-shaped (Brooks, 2008). Figure 4.1 shows that the shape of the histogram indicates that the residuals are normally distributed.

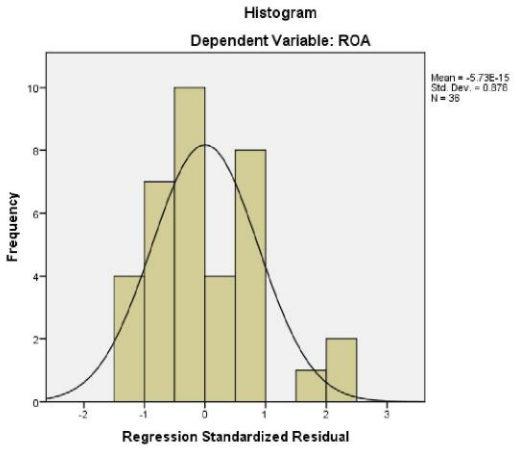

Figure 4.1 ROA model normality test

Source: SPSS output Based on Annualreportoffactoriesfrom2013-2017

3.4.2. Multicolinearity test

According to Brooks (2008) Multicolinearity is the existence of a perfect, or exact, linear relationship among some or all explanatory variables of a regression model. If the explanatory variables were correlated to one another, adding or removing a variable from a regression equation would cause the values of the coefficients on the other variables to change. As noted in Gujarati (2004) if multicolinearity is perfect, the regression coefficients of the explanatory variables are indeterminate and their standard errors are in finite. If multicolinearity is less than perfect, the regression coefficients, although determinate, possess large standard errors (in relation to the coefficients themselves), which means the coefficients cannot be estimated with great precision or accuracy.

Table 4:4 Pearson correlation matrixes Correlations

	CCP		ARP	ICP	APP	DR	CR	FGR	FS
C		1	0.	0.	-	-	0.	-	0.
ARP			1	-0.125	-0.069	0.195	-0.073	-0.004	0.301
IC				1	0.	-	0.	-	-
A					1	0.	-	0.	-
D						1	-	0.	-
C							1	-	0.
F								1	0.
F									1

Source: SPSS output Based on Annual report of factories from 2020-2025

The pair wise correlations between variables are lays between ± 1 if the correlation coefficient has positive value they are positively correlated if they have negative value they will have negative relation. As shown from table 4.3 of the correlation matrix the correlation between the explanatory variable lay between .004 and.731, by the same token the correlation among the explanatory variables was less than .731.This shows there is no higher correlation among the explanatory variables, according to LiYuqi (ascitedin Abebe,2014) stated that problem of multicolinearity exists when correlation coefficient among the explanatory variables are greater than 0.75.Fromthis,itispossibletoconcludethatthereisnomulticolinearity problem among the independent variables so that the results can be successfully estimated.

The other method to test the multicolinearity problem is the VIF and tolerance value. According to Pallant (2007) to avoid the possibility of multicolinearity, it is important that the results from collinearity diagnostics should have tolerance value above 0.10 and variance inflation factor (VIF), which is the inverse of the tolerance value, less than10 as the small value of tolerance indicate the high multiple correlation with other variables.

Table 4:5 Multicolinearity Statistics

	Tolerance	VIF
CCP	0.355	2.821
ARP	0.764	1.309
ICP	0.404	2.477
APP	0.507	1.972
DR	0.306	3.27
CR	0.324	3.085
FGR	0.867	1.153
FS	0.746	1.34

Source: SPSS output Based on Annual report of factories from 2020-2025

On table 4.4 the maximum value for variance inflation factor (VIF) is scored by debt ratio (DR) whichis3.270, while minimum valueof1.153is scored by Firm growth rate (FGR). Similarly, other statistical results of 2.821, 1.309, 2.477, 1.972, 3.270, and 1.340 are accounted respectively for CCP, ARP, ICP, APP, CR, and FS. regarding tolerance value all the variables have 35%, 76%, 40%, 50%, 30%, 32%, 87% and 75% for CCP, ARP, ICP, APP, DR, CR, FGR and FS respectively which is the minimum value of tolerance is 30%; from this VIF and tolerance value it will be possible to conclude that there is no multicollinearity problem among the independent variables.

3.4.3. Auto correlation test

According to Brook (2008) if the errors are not uncorrelated with one another, it would be stated that they are 'autocorrelated' or that they are'serially correlated'. To test the presence of auto correlation, the Durbin-Wats on testis used, Durbin Watson is a test for first order auto correlation (it is attest for a relationship between an error and its immediate previous value). If the test approaches to two, it is an indication of the absence of auto correlation. The authors Makridakis and Wheelwright (ascitedin Baveld, 2012) consider as Durbin Watson value between 1.5 and 2.5 as acceptable levels indicating no presence of collinearity. Some of these scores are somewhat lower than 1.5, but since the common rule indicates that score lower than1.0 may cause alarm, these scores are still accepted. In this study the Durbin Watson test of 1.317 for ROA model shows the absence of severe auto correlation problem.

Table 4:6 Auto correlation test for ROA model

Durbin-Watson

1.317

Source: SPSS output Based on Annual report of factories from 2020-2025

3.4.4. Hetroscedasticity

According to Brooks (2008) homoscedasticity is one of the assumptions of the CLRM which states that the variance of the errors must be constant. If the errors do not have a constant variance, they are said to be heteroscedastic. Accordingly, in order to detect the heteroscedasticity problems, Breusch- Pagan utilized in this study. This test states that if the p-value is significant at 95 confidenceinterval, the data has heteroscedasticity problem, where as if the value is insignificant (greater than 0.05), the data has no heteroscedasticity problem. Thus, as shown below there is no heteroscedasticity problem for this study hence the p value is 9% showing insignificant value.

Breusch-Pagan test for heteroskedasticity

Ho: Constant variance Variables: fitted values of

roachi2 (1) = 2.98

Prob. > chi2 = 0.0926

Source: STATA output Based on Annual report of factories from 2020-2025

3.4.5. Test result for significance of the model

In examining the effects of working capital management in sugar manufacturing company profitability, the study included eight (8) explanatory variables (i.e. cash conversion period, average conversion period, inventory conversion period, account payable period, debt ratio, current ratio, firm growth rate and firm size and one dependent variable (i.e. Return on asset).

However, to show how well the model containing those of eight explanatory Variables actually explains the variations in the dependent variables it is necessary to test it through goodness of fit statistic.

F statistics is one method of testing goodness of fit it is used to test significant of R, from the results; one can see that the model is fit with F statistics 9.335 atp-value of .000 ROA. Indicating that, over all, the model used for the study is significantly good enough in explaining the variation on the dependent variable.

Table 4:7 ANOVA linear regression for significant of

the model ANOVA

Model	Sum of Squares	Df Mean Square	f	Sig.
Regression	0.644	8	0.081	9.335
Residual	0.233	27	0.009	
Total	0.877	35		

Dependent Variable: ROA

b. Predictors: (Constant), FS, DR, FGR, ICP, ARP, APP, CCP, CR

Source: SPSS output Based on Annual report of factories from 2020-2025

Similarly, the goodness of fit of the model can be measured by the square of the correlation coefficient also called R^2. According to Brook (2008) the most common goodness of fit statistic is R^2, Brook stated that R^2 is the square of the correlation between the value of the dependent variable and the corresponding fitted values from the model. This R^2 is always lying between 0 and 1. If this correlation is high (close to one), the model fits the data well, while if the correlation is low (close to zero), and the model is not providing a good fit to the data.

From table 4.7 the value of R^2 is 73% and adjusted R^2 of 65%. From this the independent variables in the model are explaining 73% of the variations on the dependent variables. Thus, we can understand that the model of the study is providing a good fit to the data.

Table 4:8 Model summary of linear regression

Model Summary

Model	R	R Square	Adjusted Square	Std. The	Durbin-Watson
1	.857	.734	.656	.09289	1.317

a. Predictors: (Constant), FS, DR, FGR, ICP, ARP, APP, CCP, CR

b. Dependent Variable: ROA

Source: SPSS output Based on Annual report of factories from 2020-2025

3.3.6. Model Selection, Fixed Impact versus Random Impact Model.

A multivariate regression analysis is used in order to investigate the impacts of working capital management on the profitability of firms. The Fixed impacts Model explains the variations of profitability with in firms while the pooled OLS explains the variation of profitability between firms (Mathuva2009). A short coming of fixed impacts Model is that it eliminates any thing that is time invariant from the model (Deloof2003). In simple way the main difference between impact model and the random impact models is on the relationship between individual heterogeneity and the repressors. The null hypothesis states that they are systematic and the alternative states they are unsystematic. Meaning in the null hypotheses the relationship between the heterogeneity and regresses is not systematic, that is RI assumes they are uncorrelated and the alternate hypothesis states the relationship between them is systematic, that is FI assumes there exists correlation between the heterogeneity and repressors. The best way of choosing between the fixed impact model and the random impact models is running the Hausman test. The Hausman test checks a more efficient model against a less efficient but consistent model to make sure that the more efficient model also gives consistent results. According to Brooks (2008), if the p-value for the Hausman test is less than 1%, this shows that the random impacts model is not appropriate and that the fixed impacts model is to be preferred. Accordingly, table 4.8 of the Hausman specification tests shows that the model has ap-value of 0.7724. This indicates that the random impact is preferred to the model. To continue the regression by OLS the Lagrangian multiplier test is appropriate, if the probability P value is not significant it or greater than 5% it will be OLS. Therefore, from below Lagrangian multiplier test the study has a P value of 1.0000 therefore it's possible to regress by using OLS.

Hausman Specification test

Test: Ho: difference in coefficients not systematic chi2 (8) = (b-B)'[(V_b-V_B)^(-1)](b-B) = 4.86

Prob > chi2 = 0.7724

(V_b-V_Bis not positive definite)

Source: STATA output Based on Annual report of factories from 2013-2017

Lagrangian multiplier test

Breusch and Pagan Lagrangian multiplier test for

random effects roa [company, t]= Xb + u[company]+ e[company, t]
Estimated results:

| Varsd = sqrt(Var)
---------+----------
roa|.0252733.1589758
e| .0078442 .0885674 u| 0 0
Test: Var(u) =0 chibar2 (01)= 0.00
Prob>chibar2= 1.0000

Source: STATA output Based on Annual report of factories from 2020-2025

3.5. Regression

Even though the Pearson correlation analysis shows the relationship between the variables, it does not identify the causes from consequences (Shin and Soenen, 1998; and Deloof, 2003). The Pearson correlation does not provide a reliable indicator of association in a manner which controls for additional explanatory variables. Examining simple bi variant correlation in a conventional matrix does not take account of each variable's correlation with all other explanatory variables (Padachi, 2006); from this is unavoidable to undertake regression. The regression is estimated and run using Return on asset as a dependent variable. Further, all independent variables are run using cash conversion period, account receivable period, inventory conversion period, average payment period and other control variables such as debt ratio, current ratio, firm growth rate and firm size.

The study was run four models in which each independent variable is being exchanged respectively while keeping control variables constant. This is because the study wants to determine the effect of working capital management on company profitability through finding the influence of each component of working capital management individually. This choice of determining separate influences is consistence with Raheman and Nasr (2007); Sen and Oruc(2009); Deloof (2003); Teruel and Solano (2007); Rahemanand Nasr(2007); Nazir and Afza (2009);and Kaddumi and Ramadan (2010). Therefore, this section presents the regression outputs for each model

3.5.1. Regressions Result for cash conversion period (model 1)

From the Table 4.10CCP has a positive impact on ROA at.009 coefficients but insignificant at .958 P-value at 95% confidence interval. At the same time debt ratio, current ratio, and firm size had negative impact on ROA at a coefficient of -.110,-.011, and -.467 respectively and P value of .656, .964, and .009 respectively and firm growth rate has positive impact at .204 coefficient value and .238 P value. On the model summery table 4.9 there is 24% R-squared, 1.100 value of Durbin-Watson and 1.922 F-statistics.

Table 4:9 Result of Model Summary ofmodel1

				Std. Error	" Change Statistics			
		R	Adjuste	of the	R		Sig. F	Durbi
Mod	R	Squar	R	Estimat	Chang	F	Chang	Watso
1	.493	.243	.116	.14883	.243	1.922	.120	1.100

a. Predictors: (Constant), FS, DR, FGR, CCP, CR
b. Dependent Variable: ROA

Source: SPSS output Based on Annual report of factories from 2013-2017

Table 4:9 Results of multiple regressions for Model1

Coefficients
Standardized
Coefficients
Collinearity
Statistics

Model	Beta	T	Sig.	Tolerance	VIF
1		2.947	.006		
CCP	.009	.053	.958	.815	1.228
DR	-.110	-.451	.656	.424	2.358
CR	-.011	-.045	.964	.400	2.501
FGR	.204	1.204	.238	.877	1.140
FS	-.467	-2.781	.009	.894	1.119

a. Dependent Variable: ROA

Source: SPSS output Based on Annual report of factories from 2020-025

3.5.2. Regressions Result for Account receivable period (model2)

On table 4.12 Account receivable period have a positive and significant effect on Return on asset with a beta coefficient of .550 and .000 of P-value. The other variables affect the Return on assetatacoefficientof-.245, -.023, .231, and -.641 for

debt ratio, current ratio, firm growth rate and firm size respectively and except firm size that have a P value of .000 others are insignificant. The model R^2 is 50% also it is fit with the F statistics of 6.043 atp-value of 0.001. The Tolerance statistics the minimum value were .401and the maximum Variance Inflation Factor (VIF) were 2.495. It is indicating that there were no multicolinearity problems among the independent variables in the data. The Durbin-Watson (DW) result shows that 1.255.

Table 4:11 Result of Model Summary of model 2

Model Summary

				Std. Error	Change Statistics			
		R	Adjust	the	R		Sig. F	Durbi
Mod	R	Squa	R	Estima	Chan	F	Chan	Wats
1	.708	.502	.419	.12071	.502	6.043	.001	1.255

a. Predictors :(Constant), FS, DR, FGR, ARP, CR

b. Dependent Variable: ROA

Source: SPSS output Based on Annual report of factories from 2020-2025

Table 4:12 Result of multiple regressions for Model 2

Model	Standardized Coefficients			Collinearity Statistics	
	Beta Coefficients	T	Sig.	Tolerance	VIF
1 (Constant)		4.691	000		
ARP	.550	3.951	.000	.859	1.165
DR	-.245	-1.250	.221	.434	2.305
CR	-.023	-.115	.909	.401	2.495
FGR	.231	1.687	.102	.889	1.125
FS	-.641	-4.515	.000	.823	1.215

a. Dependent Variable: ROA

Source: SPSS output Based on Annual report of factories from 2020-2025

3.5.3. Regressions Result for inventory conversion period (model 3)

Inventory conversion period positively affect return on asset with a beta coefficient of.028 but it is insignificant by .872 P-values. Firm growth rate have a positive impact with .203 bet a value and the others debt ratio, current ratio and firm size have negative impact on return on asset at, -.122,-.026and -.203coefficient.Exceptfirmsize with a P value of .011the other variables are insignificant all are regress by 95% precision level. The model R^2 24% also it is fit with F statistics of 1.817 atp-value of .119. The Tolerance statistics the minimum value were 35% and the maximum Variance Inflation Factor (VIF) were 2.842. It is indicating that there were no multicolinearity problems among the independent variables in the data. The Durbin-Watson (DW) result shows that 1.093.

Table 4:13 Result of Model Summary of model 3

Model Summary

				Std. Error	"Change Statistics			
		R	Adjust	of the	R		Sig.	Durbi
Mod	R	Squa	R	Estim	Chan	F	Chan	Wats
1	.493[a]	.243	.117	.14878	.243	1.928	.119	1.093

a. Predictors: (Constant), FS, DR, FGR, ICP, CR

b. Dependent Variable: ROA

Source: SPSS output Based on Annual report of factories from 2020-2025

Table 4:14 Result of multiple regressions for Model 3

Model	Standardized Coefficients			Collinearity Statistics	
	Beta Coefficients	t	Sig.	Tolerance	VIF
1 (Constant)		2.868	007		

ICP	.028	.162	.872	.852	1.174
DR	-.122	-.499	.621	.425	2.354
CR	-.026	-.097	.924	.352	2.842
FGR	.203	1.207	.237	.892	1.122
FS	-.461	-2.709	.011	.873	1.145

a. Dependent Variable: ROA
Source: SPSS output Based on Annual report of factories from 2020-2025

3.4.4. Regressions Result for Account payable period (model 4)

Model 4 have an R^2 of 39% also it is fit with F statistics of 3.861atp-value of .008. The tolerance statistics were greater than 37% and the Variance Inflation Factor (VIF) were less than 2.688. It is indicating that there were no multi-collinearity problems among the independent variables in the data. The Durbin-Watson (DW) result shows 1.098.

From, table 4.16 the account payable period have a standardize coefficient value of -.467 at .011P-value this means the account payable period negatively impact return on asset at5 %Significant level similarly when the account payable period increases the return on asset will decrease. Also firm growth rate has positive effect with a beta value of .247. The other variables Debt ratio, current ratio and firm size have negative impact on return on asset by-.146,-.001, and -.506 of coefficient and a P-value of .536, .997 and .002 respectively.

Table 4:15 Result of Model Summary of model

				Std. Error	"Change Statistics			
		R	Adjust	of the	R		Sig. F	Durbi
Mod	R	Squa	R	Estima	Chan	F	Chan	Wats
1	.626	.392	.290	.13340	.392	3.861	.008	1.098

a. Predictors: (Constant), FS, DR, FGR, APP, CR
b. Dependent Variable: ROA
Source: SPSS output Based on Annual report of factories from 2020-2025

Table 4:16 Result of multiple regressions for Model 4

		Coefficients			
	Standardized Coefficients			Collinearity Statistics	
Model	Beta	t	Sig.	Tolerance	
0.001					
APP	-0.467	-3.379	0.002	0.684	1.463
DR	-0.146	-1.000	0.536	0.372	2.688
CR	-0.001	-0.004	0.997	0.401	2.494
FGR	0.247	1.626	0.126	0.882	1.134
FS	-0.506	-3.379	0.002	0.903	1.108

a. Dependent Variable: ROA
Source: SPSS output Based on Annual report of factories from 2020-2025

3.4. Discussion of the Result

In this subsection the result of the regression analysis was presented by supporting the result with the previous studies made in this area. This is under taken with reference of the results obtained from the regression analysis made in the previous section to examine the Impacts of working capital management on the sugar manufacturing companies. The study made regression by taking return on asset as dependent variable and cash conversion period, account receivable period, inventory conversion period, and average payment period as independent variable. The study found that account receivable period has significant positive impact on profitability and account payable period has significant negative impact on profitability. Cash conversion period and inventory conversion period has positive in significant relation with profitability. The regression results further discussed as follows.

3.4.1. Account Receivable Period

The regression result on table 4.11 State that account receivable positively and significantly affect the return on asset of sugar manufacturing factories in Ethiopia.

I thus a coefficient of .550 and P-value of .000. This means the movement in accounts receivable will significantly and positively impact profitability of sugar manufacturing companies in Ethiopia. Most of the findings indicate that there is negative impact of Accounts receivable period on profitability. This implies that a longer time span for retrieving payments from customers is associated with low profits. Deloof (2003); Lazaridisetal. (2006); Mekonnen (2011); and Gilletal. (2011) who found negative significant impact for instance, rationalize their finding by stating that firms decrease the accounts receivables in order to reduce the cash gap in the cash conversion cycle. But still there exist some in conclusiveness about the findings. Sharma and Kumar (2011) who conducted their research in India found that account receivable period has appositive effect on profitability and implies that firms can improve the profitability by lengthening the credit period for their customers. However, Ghosh and Maji (2003) found that collection period has a positive impact on EBIT, this indicate that credit facility increases sales of firm which ultimately increases profitability. Similar to the previous studies, the finding of this study rationalizes the empirical results the longer account receivable a period lead to high profitability. The rationale of this study is that grant longer credit periods in order to sustain in the market and respond to competition. Also large account receivable period may stimulate sales because it allows customers to assess product quality before paying (Deloof, 2003).

3.4.2. Account Payable

Account payable period affect return on asset significantly at .011 p-values and negatively at standardize coefficient of -. 467.This means Account payable period affect return on asset negatively at 5% significant level which is increase in Account payable period lead to decrease return on asset of sugar manufacturing factories in Ethiopia. In contrast to other researchers, Mathuva (2009) find that number of days Accounts payable has a positive impact on profitability, the study explained that firms wait longer to pay their bills in order benefit from cash available for working capital needs and longer delays in payments result in higher levels of working capital levels that can be reserved and used to increase the profitability. The rational for the empirical result is that less profitable firms tend to wait longer to pay their bills and there is another benefit by paying earlier that is discount. This is also confirmed by Deloof (2003) this result is similar with studies of the following researchers: Deloof (2003); Karaduman (2004); Lazaridis and Tryfonidis(2006); Padachi(2006); Eljelly(2004); Mathuva(2009) and Sharmaand Kumar(2011).

In the selected sugar factories, there are another debt payment method. That is the factories had inter-company transaction because they are owned Ethiopian sugar corporation. So this inter-company transaction includes spare part, machinery, vehicles, etc. Those properties value debt) should paid by the receiver factories and debt minimize from the senders one.

3.4.3. Cash Convection cycle

A popular measure of Working Capital Management (WCM) is the cash conversion cycle (Deloof, 2003. Over the years, researchers found a negative impact of number of days Cash Conversion Cycle on profitability (Soekhoe,2012); Also Amarjitetal. (2010); Ebenezer and Asiedu (2013); and Ademola (2014) study result show that cash conversion cycle has positive but insignificant impact on profitability of the manufacturing firms. The study empirical result shows that cash conversion period has insignificant positive impact on Return on asset with a coefficient of .009and P value of .958. The longer this time lag, the larger the investment in working capital. A longer cash conversion cycle might increase profitability because it leads to higher sales (Deloof,2003). From this firm can maximize profitability by increasing the cash conversion period, but it is not a critical factor to consider when taking decision to improve profitability.

3.4.4. Inventory conversion Period

According to table 4.13 inventory conversion periods has positive and in significant impact on return on asset on Ethiopian sugar manufacturing factories at standard coefficient of .028 and P- value of .872. While researchers found a negative impact of number of days of inventories on profitability i.e.Deloof (2003);Karaduman(2004); Raheman and Nasr(2007); Lazaridis and Tryfonidi (2006); Ternel and Solano (2007); Mekonnen (2011); and Wibishet (2014). There also exists a contradictory Mathuv(2009); Kaddumi and Ramadan(2010); and Soekhoe (2012) found a

positive impact of inventory conversion period on profitability correspondingly Amarjitetal., (2010) found that profitability positively and insignificantly impacted by inventory conversion periods. Mathuva (2009) suggests that by having high inventory levels firms reduce bottlenecks in the production process and the loss of business due to deficiency of products also Soekhoe (2012) investigates the impacts of Working Capital Management on the profitability over a period of five years for Dutch Listed firms find a significant and positive effect of inventory conversion period on profitability. The study states that Dutch firms hold high inventory levels in order to increase the profitability in terms of reducing the supply costs (economies of scale) and to prevent bottle necks in the production process due to scarcity of products. This also reduces the supply costs of products and protects the firm from possible price fluctuation due to macroeconomic factors. Maintaining high levels of inventories also helps in reducing the cost of supplying the products and protects the firm against price fluctuations as a result of adverse macroeconomic factors. The rational for this empirical result is inventory conversion period impacts return on asset positively but it has insignificant P value; when inventory conversion period increase the profitability of sugar manufacturing company also increase. Similar to the previous finding shaving large inventory protect the companies from stock out sin time of high demand because this time market fluctuates according to demand and supply hence larger inventory reduces the risk of a stock-out also increasing inventory lead to increase profitability by producing products at a time of low resource cost according Deloof (2003) large inventory may lead to higher sales.

3.5. Hypothesis Testing

The following section provides the results for each explanatory variables and their importance in determining the profitability of sugar manufacturing factories in Ethiopia.

HP1: Cash conversion period has negative significant impact on sugar manufacturing factories profitability in Ethiopia.

The result of model-1 in table 4.9 indicated that cash conversion period have insignificant negative (-.019) impact on profitability of sugar manufacturing factories having (P-value=
0.915). Therefore, the null hypothesis was failed to rejects in the cash conversion period has no significant negative effect on profitability.

HP2: Accounts receivable has significant negative impact on sugar manufacturing factories profitability in Ethiopia.

The second hypothesis was accept the null hypothesis because of account receivable period significantly and positively impact on the profitability of sugar manufacturing factories in Ethiopia at .550 of beta value and .000P value as shown on table 4.11.

HP3: Inventory holding period has significant negative impact on sugar manufacturing factories profitability in Ethiopia.

The result in Table 4.13 shows that inventory conversion period have positive impact on profitability of sugar manufacturing factories in Ethiopia but it was found to be insignificant since the p-value is .872. Therefore it is possible to accept the null hypothesis since inventory conversion period has positive insignificant impact on profitability.

HP4: Accounts payable period has significant negative impact on sugar manufacturing factories profitability in Ethiopia.

At the table 4.15 the coefficient of account payable period (APP) shows -.467 and P value of 011 indicating that average payment periods has significant negative effect on profitability at 5% significance level. Therefore, null hypothesis was failed to accept in the study because average payment period has negative significant impact on profitability of sugar manufacturing factories in Ethiopia.

HP5: Liquidity has significant negative impact on sugar manufacturing factories profitability in Ethiopia.

The study use current ratio as a measure of liquidity. The result of regression indicated that current ratio has negative but insignificant impact on profitability of sugar manufacturing factories. Therefore, the null hypothesis was accepted because of insignificant impact of liquidity on profitability.

HP6: Firm size has significant positive impact on sugar manufacturing factories profitability in Ethiopia.

The results show that firm size has negative and statistically significant impact on profitability. Thus, any increase in firm size is accompanied with a

decreased in profitability. The result is similar with the findings of Ali and Hassan (2010) who found a negative and significant impact of firm size on profitability. This suggests that the larger the size of the firm, it's difficult to manage its production and thus reduce its profitability. Then the study accepts the null hypothesis which states, Firm size has no significant negative impact on sugar factories profitability in Ethiopia.

HP7: Debt used has significant negative impact on sugar factories profitability in Ethiopia.

The result in the models shows that debt ratio have negative impact on profitability of sugar manufacturing factories in Ethiopia but insignificant P value. In Ethiopian sugar manufacturing factory on average 49% of their asset Finance by debt but this result is insignificant. Therefore, the null hypothesis was accepted because according to the finding of the study debt ratio has a negative insignificant impact on profitability.

HP8: Firm growth rate has positive significant impact on sugar factories profitability in Ethiopia

Firm growth rate has positive but insignificant impact on profitability. Therefore, null hypothesis was failed to reject in the study because of firm growth rate has positive in significant impact on profitability of sugar manufacturing factories in Ethiopia.

3.6. Debt used and profitability

The way that managers are financing heir business impacts profit of the firm because it has its own impact by the means of interest and other charges. Total debt to total assets ratio was used as a proxy for Financial Leverage (FL) Abera (2010). In all time internal and external finance are not perfectly substitutes in practice. External finance, like debt may be more expensive than internal finance because of market imperfections. In these circumstances, a firm's investment and financing decisions are interdependent. Firms may have a target cash conversion Cycle as a measure of working capital which balances costs and benefits and hence, maximizes the value for the firm. For this reason, the cost of the funds invested in the cash conversion cycle is higher in firms with a larger leverage, because they have to pay a higher interest charge. Therefore, it is possible to anticipate a negative relationship between leverage ratio and profitability Mekonnen (2011). According to Deloof (2003) when leverage of the firm increases; it will adversely affect its profitability while financial debt ratio used as a proxy for leverage. Based on the previous studies done by researchers the following hypotheses are identified:

3.7. Documentary Review and Analysis

The last section of this chapter presents reviews of different documents, manuals and financial reports related to an impact of working capital management on profitability of case study area of selected sugar factories. In this regard the researcher wants to present summarized information after reviewing different materials that are related to the research topic.

The Ethiopian sugar corporation is established by Government proclamation in the 2nd day of December 2010 to undertake the responsibility of the entire Ethiopian Sugar sector development. It plays a leadership role in the development, management and marketing of sugar and its byproducts.

Following its establishment the Sugar Corporation has launched short- and long-term capacity building programs targeted to support the large-scale sugar development in the country. Capacity building shall focus on Research and Human resource training in sugarcane agriculture, Sugar industry and support services related to financial management.

IV. CONCLUSIONS AND RECOMMENDATION

4.1. Conclusion

Working Capital Management is an important component of corporate financial management and it refers to management of current assets and current liabilities. Its management impacts the profitability of the factory. To achieve the objective of the study data was analyzed on quantitative basis using descriptive statistics, Pearson's correlation and OLS regression analysis.

Descriptive results show that the sugar factories on average earned a net income of .0480 from its total asset, with the maximum value of.48 and minimum value of -.22 of ROA. The cash conversion period which is a compressive measure of working capital measured by adding account receivable period to inventory conversion period then subtracts account payable period has an average value of 148 and also has a minimum value of-761 and maximum value of

985. Firms in the sample wait 187 days on average to collect cash from credit sales. On the other hand, the Accounts payable period measures the average number of days it takes an entity to pay its suppliers has a mean value of 238. The minimum day of account payable is -26 and has a maximum day of 969. The other independent variable used in the study was the inventory conversion period which is a measure of days of inventory wait until its sales. From the descriptive result the sugar manufacturing factory's wait an average of 404 days and has a minimum value of -485 and maximum value of 904.

The Pearson correlation result shows account payable, debt ratio, current ratio and firm size have negative relation with a coefficient of -.299, -.054, -.076, and-.440 respectively with return on asset. On the other hand cash conversion period, account receivable period, inventory conversion period and firm growth rate have positive relation with Return on asset by a correlation coefficient of.058, .309, .055 and.150 respectively regression was used to examine the impact of working capital management on Ethiopian sugar manufacturing companies' profitability but before running the regression the CLRM assumptions were tested such as normality test, Multicolinearity test, auto correlation test, hetroscedasticity test, and test for significance of the model were tested and all tests fulfilled the assumption. Based on the regression result the study found that profitability has affected positively by account receivable period from this Ethiopian sugar manufacturing factories can improve their profitability by increasing period of account receivable. The rationalist granting longer credit periods will lead to sustain in the market and respond to competition also It may stimulate sales because it allows a firm to access product quality before paying.

Accounts payable period has a significant negative impact on Ethiopian sugar manufacturing factories profitability. The rational for the empirical result is that less profitable firms tend to wait longer to pay their bills (This is also confirmed by Deloof, 2003) and there is another benefit by paying earlier that is discount.

The regression result also indicates that inventory conversion period and cash conversion period have no significant impact on profitability of Ethiopian sugar manufacturing factories. Furthermore control variables i.e. debt ratio, current ratio, and firm growth rate have no significant impact on sugar manufacturing factories profitability, but contrary to the theoretical predictions and most empirical findings the study found significant negative impact of firm size on profitability this shows that the larger the size of the firm, it is difficult to manage its production factors and thus reduce its profitability furthermore, increase in firm size lead to underutilization of fixed facilities and the resultant maintenance cost.

Generally Ethiopian sugar manufacturing factories have large amounts of cash invested in working capital. It can therefore be expected that the way in which working capital is managed will have a significant impact on profitability of those factories. Out of four independent variables; only two were significant i.e. 'accounts receivables period' and 'accounts payable period', as the coefficient of.550 and-.467 at 1% and 5% significant level respectively, Accounts receivables period influence most in predicting profitability. These results suggest that managers can increase profitability by reducing the account payable period and increasing the Accounts receivable Period to a reasonable maximum level. The overall result showed that working capital management impacts profitability of sugar manufacturing factories.

4.2. Recommendation

Based on the result of the regression analysis, the study forwarded the following recommendations.

- The findings indicate that working capital management, particularly managing cash and account receivables is important for the purpose of increasing sales and decreasing operating costs. Working capital has an important role for value creation. It is particularly important for the purpose of increasing sales by managing trade receivables.
- Ethiopian sugar manufacturing factories better lengthen their credit period to their customers by implementing applicable collection policy for the sector. Factories have to be careful while selling in credit because in having long account receivable period it may leads to high bad debts. As much as possible, bad debts should be maintained to the minimum possible amount in

the management because it may lead to liquidity problems which may lead to the total collapse of the business.

- The management can also create value for their increasing inventories to a reasonable level. Firms can also take long to pay their creditors in as far as they do not strain their relationship with the creditors.
- Firms are capable of gaining sustainable competitive advantage by means of effective and efficient utilization of the resources of the organization through a careful reduction of the cash conversion cycle to its minimum. In so doing, profitability of the company is expected to increase.
- The study recommends that in order to increase profitability Ethiopian sugar manufacturing factories have to pay their bills early from this action the firm can benefit from discount (delaying of payables can be expensive if a firm is offered a discount for the early payment) and will have a worthy relation with the suppliers for future transaction.

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