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ANALYZING THE IMPACT OF WORKING CAPITAL MANAGEMENT ON  
CORPORATE PROFITABILITY

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## TABLE OF CONTENTS

<b>ACKNOWLEDGEMENTS</b> .....	ii
<b>ABBREVIATIONS</b> .....	ivi
<b>LIST OF TABLES</b> .....	vi
<b>LIST OF FIGURES</b> .....	vii
<b>ABSTRACT</b> .....	ix
<b>ÖZET</b> .....	ix
<b>INTRODUCTION</b> .....	1
<b>FIRST CHAPTER</b> .....	3
<b>1.1. OVERVIEW: WORKING CAPITAL MANAGEMENT</b> .....	3
<b>1.1.1. Definition and Importance of Working Capital Management</b> .....	3
<b>1.1.2. Components of Working Capital Management</b> .....	10
<b>1.1.2.1.Account Receivable Management</b> .....	10
<b>1.1.2.2.Inventory Management</b> .....	12
<b>1.1.2.3.Accounts Payable Management</b> .....	15
<b>1.1.2.3.WCM Ratios</b> .....	16
<b>1.1.3. Types of Working Capital Management</b> .....	19
<b>1.1.3.1.Gross Working Capital</b> .....	19
<b>1.1.3.2.Net Working Capital</b> .....	20
<b>1.1.3.3.Permanent Working Capital</b> .....	20
<b>1.1.3.4.Temporary Working Capital</b> .....	21
<b>SECOND CHAPTER</b> .....	23
<b>2.1. LITERATURE REVIEW</b> .....	23
<b>2.1.1. Working Capital Management Studies in International Area</b> .	23

<b>2.1.1.1 Studies on Developed Countries.....</b>	<b>23</b>
<b>2.1.1.2 Studies on Developing Countries.....</b>	<b>25</b>
<b>2.1.2. Working Capital Management Studies in Turkey .....</b>	<b>24</b>
<b>THIRD CHAPTER .....</b>	<b>31</b>
<b>3.1. DATA AND SAMPLE DESCRIPTION .....</b>	<b>31</b>
<b>3.2. METHODOLOGY.....</b>	<b>37</b>
<b>3.3. PANEL DATA ANALYSIS.....</b>	<b>37</b>
<b>3.4. EMPRICAL RESULTS.....</b>	<b>39</b>
<b>3.4.1. Descriptive Analysis.....</b>	<b>39</b>
<b>3.4.2. Correlation Analysis.....</b>	<b>40</b>
<b>3.4.3. Regression Analysis.....</b>	<b>41</b>
<b>CONCLUSION.....</b>	<b>45</b>
<b>REFERENCES .....</b>	<b>46</b>
<b>APPENDIX .....</b>	<b>52</b>

## **LIST OF ABBREVIATIONS**

BIST: Borsa Istanbul

FD: Financial Debt

SG: Sales Growth

DSO: Days Sales Outstanding

DIO: Days Inventory Outstanding

DPO: Days Payable Outstanding

CCC: Cash Conversion Cycle

GOI: Gross Operating Income

ROI: Return on Investment

Et al.: And Others

OLS: Ordinary Least Square

WCM: Working Capital Management

## LIST OF TABLES

<b>Table 3.1.1: BIST Retail and Wholesale Companies of the Study.....</b>	<b>32</b>
<b>Table 3.1.2: Dependent Variables of the Study .....</b>	<b>33</b>
<b>Table 3.1.3: Independent Variables of the Study .....</b>	<b>33</b>
<b>Table 3.1.4: Control Variables of the Study .....</b>	<b>33</b>
<b>Table 3.4.1: Descriptive Analysis.....</b>	<b>52</b>
<b>Table 3.4.2: Correlation Coefficients Analysis.....</b>	<b>53</b>
<b>Table 3.4.3: Profitability and Working Capital: OLS Regressions.....</b>	<b>54</b>
<b>Table 3.4.4 Profitability and Working Capital: Fixed Effects Regression Model.....</b>	<b>55</b>
<b>Table 3.4.5 Profitability and Working Capital: OLS Regressions .....</b>	<b>56</b>
<b>Table 3.4.6 Profitability and Working Capital: Fixed Effects Regression Model.....</b>	<b>57</b>
<b>Table 3.4.7 Profitability and Working Capital: OLS Regressions .....</b>	<b>58</b>
<b>Table 3.4.8 Profitability and Working Capital: Fixed Effects Regression Model</b> <b>.....Error! Bookmark not defined.</b>	
<b>Table 3.4.9: Formulas .....</b>	<b>60</b>
<b>Table 3.4.10: Thesis Structure.....</b>	<b>61</b>
<b>Table 3.4.11: Data and Method Structure .....</b>	<b>62</b>

## LIST OF FIGURES

<b>Figure 1.1.1.1 Two-dimensional Approach of WCM.....</b>	<b>5</b>
<b>Figure 1.1.1.2 Operating Cycle and Cash Conversion Cycle .....</b>	<b>7</b>
<b>Figure 1.1.1.3 The Elements Determining the Working Capital Level.....</b>	<b>9</b>
<b>Figure 1.1.2.1.1 The Elements Determining the Accounts Receivable Level ...</b>	<b>11</b>
<b>Figure 1.1.2.1.2 The Accounts Receivables Management Process.....</b>	<b>12</b>
<b>Figure 1.1.2.2. The Elements Determining the Inventory Level.....</b>	<b>14</b>
<b>Figure 1.1.2.3. Short-term Funding Sources.....</b>	<b>16</b>
<b>Figure 1.1.2.4. Ratios of WCM.....</b>	<b>18</b>
<b>Figure 1.1.3 Types of WCM.....</b>	<b>19</b>
<b>Figure 1.1.3.3 Permanent Working Capital.....</b>	<b>21</b>

## **ABSTRACT**

In business, WCM has a critical role because of directly effectiveness of profitability. This thesis aims to give empirical results on impacts of WCM on profits. It is conducted for 11 years period which is from 2008 to 2018 focusing on retail and wholesale companies operating in Turkey. The data source consists of companies which are listed on the BIST. To measure WCM, CCC is used and GOI, NOI, and ROA are measurements of profitability. Also, correlation and descriptive analysis, OLS and Fixed Effects regressions are used to perform regressions.

The study shows that there is a significant and negative relationship between profitability and CCC. To sum up, a negative relationship observed between CCC and profitability; longer CCC, profitability decreases. Also, a negative relationship between DSO and profitability. If the collection period is long, the profitability decreases. It is likely to, there is a negative relationship between DIO and profitability; longer the inventory holding periods, the profitability decreases. When we look at the DPO and profitability relation, we see a negative relationship which means shorter the days payable outstanding, the profitability increases. All equations were estimated by regression analysis as utilized by Deloof (2003).

**Key words:** Corporate Profitability, Working Capital, Panel Data Analysis, BIST

## ÖZET

İşletme sermayesinin, karlılığı doğrudan etkilemesi nedeniyle iş dünyasında kritik bir rolü vardır. Bu araştırma, Türkiye’de toptan ve perakende sektörlerinde faaliyet gösteren şirketlerin, 2008 ve 2018 aralığındaki dönemde işletme sermayesi yönetimi ile karlılık arasındaki ilişkiyi ampirik kanıtlar sunmak amacıyla incelemektedir. Veri kaynağı, Borsa İstanbul’da işlem gören şirketlerden oluşmaktadır. İşletme sermayesi yönetimini ölçmek için nakit dönüşüm süresi, firma karlılığını ölçmek için ise brüt faaliyet karı, net faaliyet karı ve aktif kârlılığı kullanılmaktadır. Analizde, Pearson korelasyonu, En Küçük Kareler Regresyon Yöntemi ve Sabit Etkiler Regresyon Yöntemi kullanılmıştır.

Çalışma sonuçları karlılık ve işletme sermayesi yönetimi arasında istatistiki açıdan anlamlı ve negatif bir ilişki vermektedir. Özetle, nakit dönüşüm süresi ile karlılık arasında negatif bir ilişki vardır, nakit dönüşüm süresi ne kadar uzunsa karlılık o kadar azdır. Ayrıca, alacak tahsil süresi, stok çevrim süresi ve ticari borç ödeme süresi ile karlılık arasında da istatistiki olarak anlamlı ve negative sonuçlar görülmüştür. Tüm denklemler Deloof (2003) tarafından kullanılan regresyon analizi ile hesaplanmıştır.

**Anahtar Kelimeler:** Őirket Karlılıđı, İŐletme Sermayesi, Panel Veri Analizi, Borsa İstanbul

## INTRODUCTION

The main purpose of businesses is to make profit and serve society. Companies have to produce goods and services to achieve these goals and be sustainable. Corporate finance has an important role to achieve these targets. Corporate finance is directly connected with capital budgeting and WCM. Capital structure and WCM decisions have great importance for long term business success. Also, WCM has an important role in financial management decisions. WCM focuses on short-term investment decisions and their effects. It directly affects liquidity (Sharma and Kumar, 2011). It is believed to be one of the most remarkable elements of management. Financial managers may take important decisions to get over specific issues with controlling and planning working capital.

WCM has great importance for the business. It is possible for the business to provide a continuous production and to operate at full capacity with a correct WCM. The company can fulfil its responsibilities and obligations with effective WCM. WCM can help managers to improve short and long term strategies in the right way and to lead financial management effectively.

In recent years, the interest of researchers, academics, and company managers has started to increase about WCM. It is becoming more important and popular. According to the company of PwC UK's "Working Capital Report 2019/20"; working capital improves fast and it becomes one of the popular value measurements among firms. It is an important key to company's profitability criteria. It has also a big role in corporate finance. A finance manager can evaluate the needs of WCM by using traditional methods of ratio analysis and academic metrics.

Effective WCM is very important and it is related to the company's ability to adopt quickly to unpredicted developments in the market. For example volatility in interest rates, prices for raw materials and exceptional circumstances. Companies' aim is being prepared for unexpected changes and maintaining a competitive advantage in the market (Dursun and Ayriçay, 2013). Being functional

and effective in WCM is a very critical and important issue for the companies because it is directly related to profitability. Companies' ability to pay short term debts on time is very critical and WCM helps to manage payment periods.

Moreover, it gives suppliers, customers, creditors, and investors a snapshot of how the business operates. In addition to this, it contains managing current assets and liabilities of companies. WCM includes inventory management, management of accounts payables and accounts receivables. In the strict sense, the mean for the working capital is  $\text{inventory} + \text{accounts receivable} - \text{accounts payable}$ . Firms use various strategies and policies to manage components of WCM.

There are a lot of methods and measures which researchers use to investigate the efficiency of WCM. Deloof uses the CCC and it is a usual measurement among researchers. CCC is a metric that is clarified in days. It is the time interval between the expense of buying raw material and getting cash from clients. If CCC days are longer, working capital needs more finance for itself. Maybe longer CCC can provide more sales and more profitability. In other respects, if CCC is longer and the cost of investment is high that can cause lower profits (Deloof, 2003).

Lots of researchers examine the impact of WCM and its components on company profitability in different countries and markets. The prime aim of this study is to find out impact of the CCC on the working capital components. There are limited studies in Turkey in the frame of the retail and wholesale sectors. Accordingly, this paper is done in the retail and wholesale sectors.

In this thesis, the main purpose is to analyse the effect of WCM and its components on company profitability. It consists of three parts. In first chapter of this study; definition, importance, components, types of WCM are examined. Also measures and analysis of working capital are included in the first part. In the second part, the studies on the working capital have been collected by domestic and international studies. In the third and last part, the rates calculated from the annual financial statements of the 15 firms operating in the retail and wholesale industry

and registered in the BIST between 2008 and 2018 were analysed by various tests and the effects of WCM on firm profitability were determined. The third chapter describes data, sample, descriptive, correlation and regression analysis. Also there is a summary part and it deals with results of analysis and recommendations to managers.

## **FIRST CHAPTER**

### **1.1. OVERVIEW: WORKING CAPITAL MANAGEMENT**

WCM is important for management because it directly affects firms' liquidity and profitability. Overview section is associated with WCM. Additionally, this part highlights the importance of working capital.

WCM has an important and critical role on financial management that is very important for the company to work at full capacity, to continue production uninterruptedly, to increase its business volume, and not to face financial difficulty in extraordinary situations (Aksoy and Yalçın, 2008).

In order to understand the importance of WCM for companies; definition, importance, components and types of WCM are analysed and explained in this chapter.

#### **1.1.1. Definition and Importance of Working Capital Management**

According to the literature, traditional meaning of working capital is the difference between the current assets and liabilities (Preve and Sarria-Allende, 2010). It means WCM is directly about managing current assets and liabilities (Gill, 2010).

The current assets are cash, bank deposits, accounts receivables, marketable securities and inventories. The current liabilities are accounts payable, short term

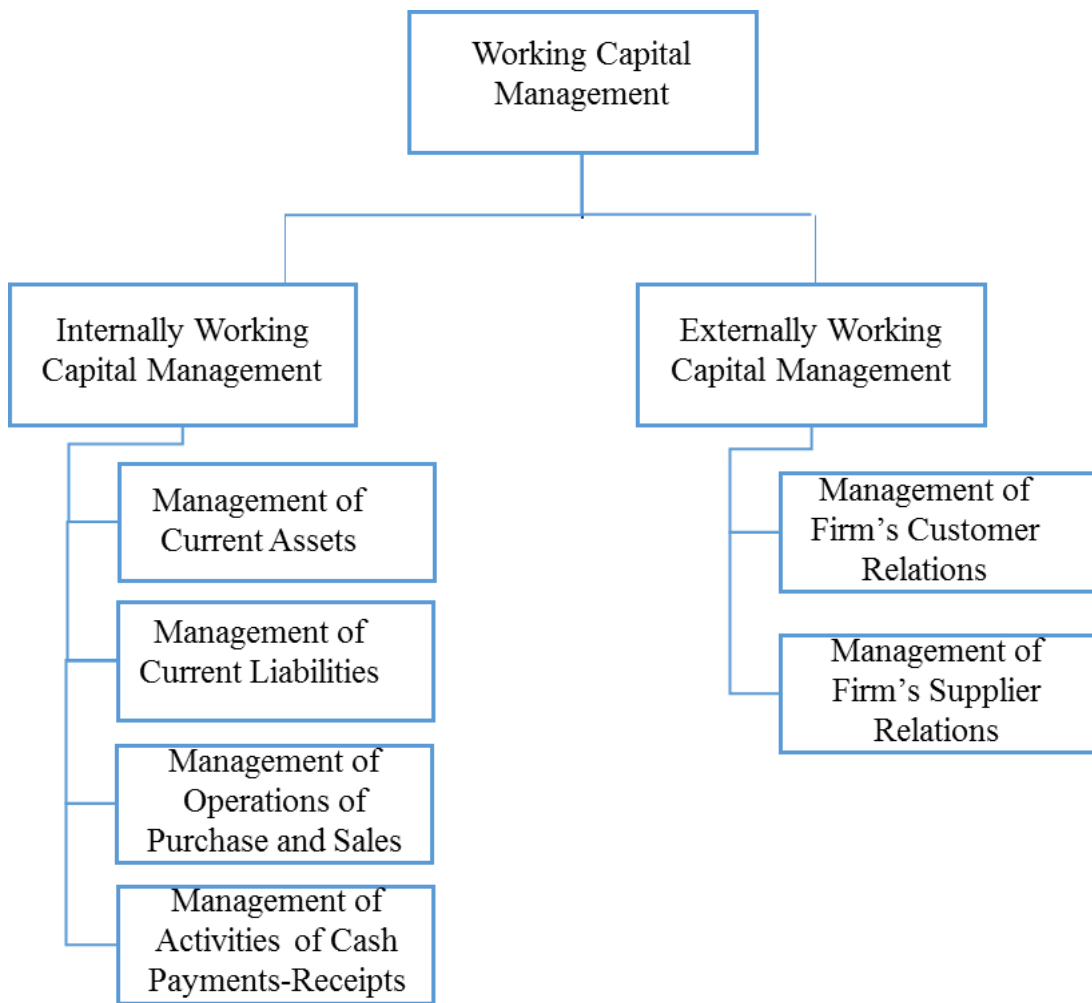
bank loans, notes payable, income taxes and interest payable on outstanding debts. If the companies examine carefully their accounts receivables, marketable securities, cash, and inventories; that can help companies to get higher profits.

With another explanation, working capital is the name given to the assets of the companies that have the feature of turning into money in a short time. There are two types of working capital: gross and net working capital. Gross working capital is considered in terms of current assets and it covers only them. Also, the part exceeding short term debts is defined as net working capital. Companies generally use current assets for paying short-term liabilities.

The literature supports the statement that WCM is becoming important and crucial. It needs a careful investigation for managing assets and liabilities. Because of their importance for the companies' financial health, they need to be carefully analysed. Due to this, effective WCM includes the planning and controlling of current assets and short-term liabilities to eliminate the risks that the company may encounter while fulfilling its short-term obligations. It is up to effective WCM that firms can pay short-term debts on time, perform business activities, make higher profits and be prepared for extraordinary situations.

Today, WCM is examined with a two-dimensional approach, internal and external. It is detailed below in Figure 1.1.1.1 (Baig, 2009). Inside the company, efficient management of current assets and short-term liabilities can improve operational activities and WCM. In external side, relationships with customers and suppliers will improve the firms value.

**Figure 1.1.1.1 Two-dimensional Approach of Working Capital Management**



Source: Baig, 2009 - Prepared by Author

To sum up, working capital has the following features (Poyraz, 2012):

- It has a divisible feature,
- It is short-term and liquid,
- Working capital elements are dynamic and interrelated,
- Working capital decisions can be revised in a short time,

In brief, the some of the main objectives of WCM are as follows:

- Managing current assets to increase contributions to increase firm value,
- Minimizing the cost of capital used in financing current assets,
- To meet the firm's liabilities, working capital level must be optimal.

Effective WCM is an important point in setting business strategies that help companies to increase shareholders' value. That's why providing optimum balance at working capital is another important issue. Target of WCM is to set an optimum balance between WCM and its components (Gill, 2011). WCM involves a strong relation between profitability and risk. Avoiding over-invest in current assets may provide the optimum balance between risk and profitability (Afza and Nazir, 2007; Deloof, 2003). According to the theory of risk and return, investments with higher risk may create higher returns. Thus if a firm has high liquidity, it will have a low risk to face financial difficulties (Garcia-Teruel and Martinez-Solano, 2007). In other words, one of the main targets of WCM is to make the company sufficient liquidity to be sustainable and to meet its obligations (Eljelly, 2004). It is one of the best measures of liquidity and it can be a good and cheap finance way without a need for external sources (Eljelly, 2004). Consequently WCM can affect the firm's profitability and risk as well as its value (Smith, 1980). Also being at an optimum level in the CCC can strengthen profitability (Ahmed, Awan, Safdar, Hasnain and Kamran, 2016). In addition to them, optimum working capital levels and effective WCM can increase company value (Afza and Nazir, 2007; Deloof 2003).

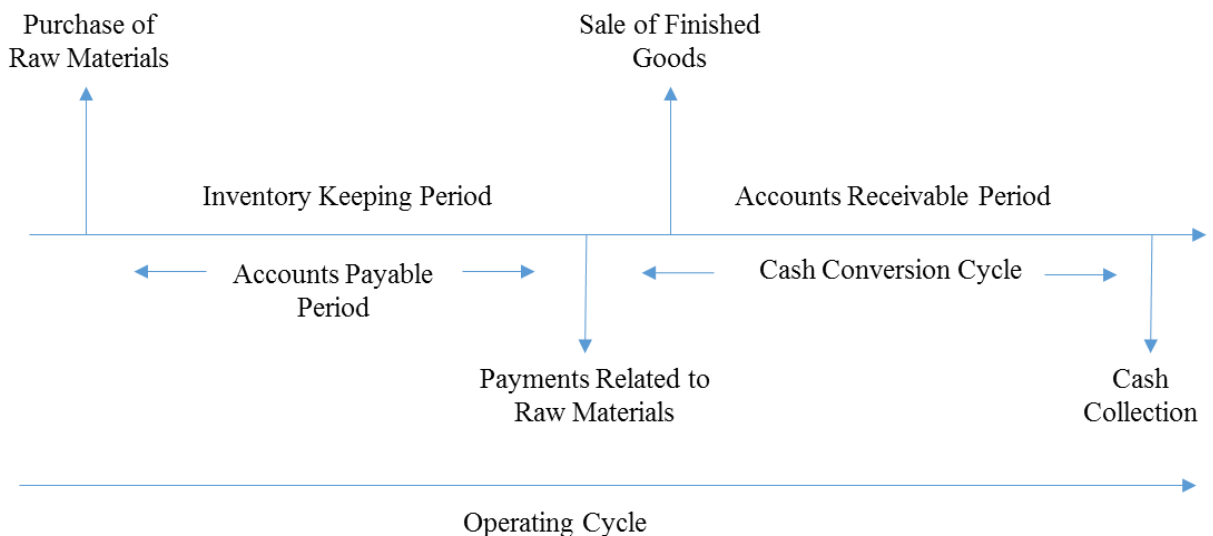
The importance of WCM in businesses is increasing given some issues. These factors can be listed in below (Aksoy and Yalçiner, 2008).

- Time allocated to WCM,
- Investment in current assets,
- Relationship between the expansion of business volume and WCM,
- The importance of WCM for small firms,

Investigators use several different metrics to investigate the efficiency of WCM. CCC is the most popular measure of WCM. It can be defined as the period between buying raw material and collecting cash from selling products (Deloof, 2003). This measure tell how much time the company needs to sell its inventory, to collect accounts receivables, and to pay its bills on time. By shortening the CCC, finance managers can see positive or negative effects on the firm’s profitability.

The most important tool to help understand the elements and needs of working capital and how it should be met is the CCC (Sharma and Kumar, 2011). In Figure 1.1.1 the whole operating cycle and CCC are shown (Jose et al, 1996).

**Figure 1.1.1.2 Operating Cycle and Cash Conversion Cycle**



Source: Jose et al. (1996) - Prepared by Author

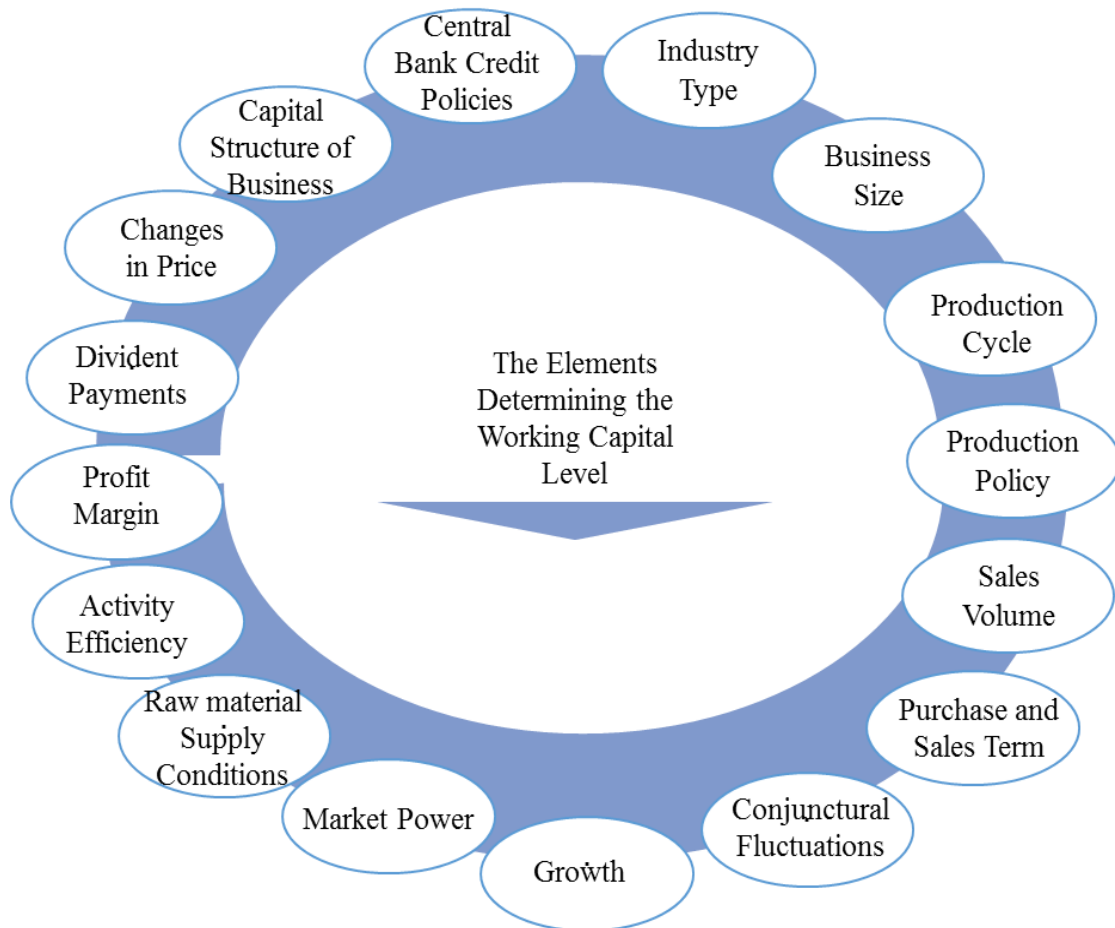
As can be understood from Figure 1.1.1, it starts with the purchase of raw materials and it continues with processing the raw materials into the production stage and turning them into final products. It is a process that continues as the sale

of final products and receivables are collected and converted into cash again. The decisive factor in the working capital requirement is the length of this process. The CCC can be positive or negative. The positive cash cycle indicates the day the companies borrow while awaiting payment from customers. Also, the negative CCC means a cash inflow from sales before paying suppliers. Managers prefer to shorten the cash cycle time as much as possible and even be negative (Tomak, 2013).

As it is mentioned before, the current assets of an enterprise are referred to as working capital. The other feature of them is during operating business activities they convert from one type to another. For example, when raw material is purchased by cash, cash becomes raw material stocks. Then, when the raw materials are used in production, they first turn into semi-finished and finished goods respectively. When the products are sold, they become receivables and when the receivables are collected, they become money. Thus, the cycle that starts with cash is completed with cash (Gürsoy, 2006).

The level of working capital need is very critic and important in business life. There are lots of determinant factors that firms face. Such as delays in payments, disruptions in production, problems stemming from the supplier, stagnation, and inability to collect receivables can increase the need for working capital. Many factors that affect the need for working capital. It is detailed below in Figure 1.1.1.3.

**Figure 1.1.1.3. The Elements Determining the Working Capital Level**



Source: Satrapyasad ve Raghu 2010 - Prepared by Author

Also there are some different ways which are used by finance managers. Investing on current assets and financing decisions can be stated in three ways, such as conservative, moderate and aggressive. These strategies are unique and firms choose one based on their strategies and benefits.

## **1.1.2. Components of Working Capital Management**

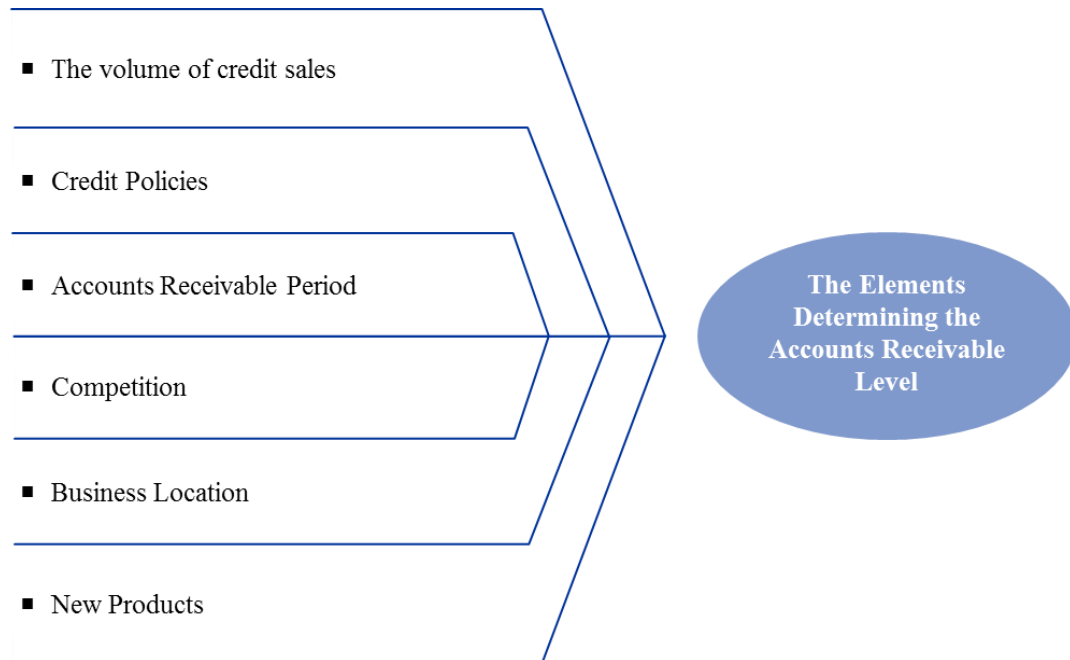
### **1.1.2.1. Account Receivable Management**

The cash has an important role in business life. Most companies prefer the cash during selling or giving service but it is not possible in all time. For various reasons, companies are required to carry out activities on a term basis. The element of the receivable consists of obtaining goods and services of an enterprise and cash in return for post payment (Aksoy and Yalçın, 2008). Receivables increase with the sale of goods and services which are related to the main activities of the company.

The main aim of accounts receivable management is to increase the firm's profit. In an increasingly competitive environment, firms go towards credit sales to reach more customers and increase sales. Credit sales can increase the firm's sales and profits. On the other hand, during the sales are increasing, overdue receivables can increase and that makes high costs. There are different risks and costs in account receivable management. Such as; the opportunity cost of connecting business funds to accounts receivable, administrative costs associated with collecting and monitoring receivables, cost of non-reimbursement doubtful trade receivables (McLaney, 2009). Given all this, the business credit sales and collection policies become more important. Criteria to be searched for customers with credit sales, maturity policy to be applied in credit sales should be defined carefully.

Account receivables management should protect the firm's liquidity by taking care of risk and profitability relationship. With this aspect, firms should decide by evaluating the receivables in a similar way to a capital investment. There are lots of factors affecting this decision and affecting the amount of receivables that the enterprise can control and cannot control (Akgüç, 1998). Many factors that affect the level of accounts receivable. It is detailed below in Figure 1.1.2.1.1.

**Figure 1.1.2.1.1 The Elements Determining the Accounts Receivable Level**

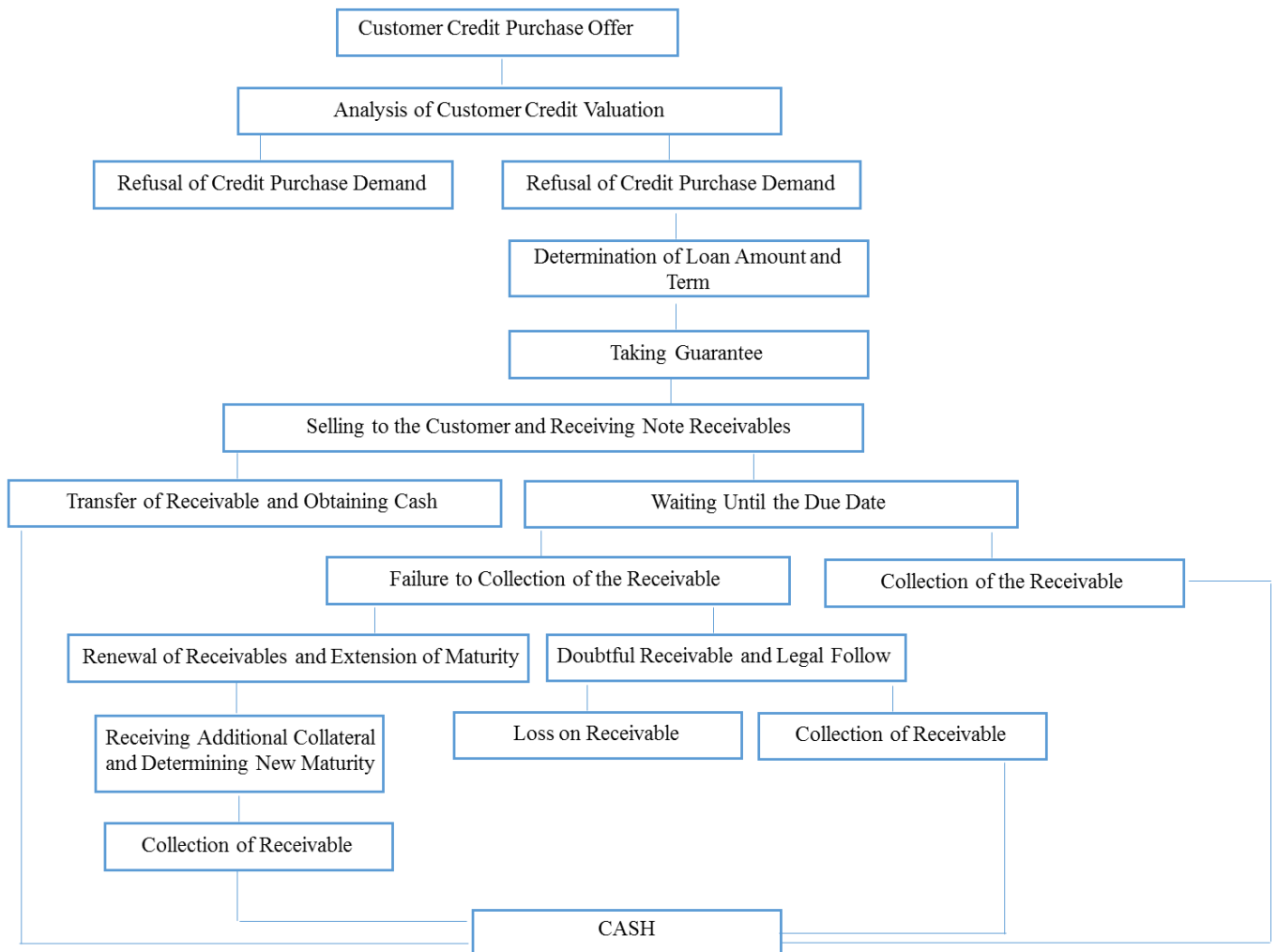


Source: Satrapyasad ve Raghu 2010 - Prepared by Author

There are some other factors that affect the accounts receivable level such as feature of the goods and services sold, economic conditions, collection policy and effectiveness in collecting receivables, customers' qualifications and credit limits and the degree of use of receivables (Aksoy and Yalçiner, 2008).

In today's conditions, the management process of accounts receivables becomes very critical and important for corporates. Successful finance managers take care to operate the collection process with strict and consistent practices in the management of receivables and use collection plans with various scenarios for their commercial receivables. Also, the billing process and legal tracking of overdue receivables are very important. The accounts receivables management process is defined in Figure 1.1.2.1.2.

**Figure 1.1.2.1.2 The Accounts Receivables Management Process**



Source: Aksoy, Yalçiner 2008- Prepared by Author

### 1.1.2.2. Inventory Management

Inventories are the items that have the least ability to turn into money among the components of working capital. That's why, inventories can be affected by the price changes. The share of stocks in current assets is very high in lots of companies. That can vary from one company to another. The importance of inventory

management is increasing especially in companies that have high competition and technology changes frequently. The main aim of inventory management is to determine the stock level where the total stock costs will be the least and the profitability of the company will not decrease (Smith, 1980).

The purpose of the stock management is to determine the most economical and suitable stock amount for the corporates. That's why, controlling stock levels and stock movements regularly is very important. To minimize the costs and to maximize the profits, effective inventory management has an important role for managers. Companies keep stock to carry out their activities regularly and efficiently and to respond to the demand on time. Inventory management concerns many different departments within the company. Since it serves the customer, it concerns marketing, production for efficiency, financing for inventory costs (Üreten, 1998). Inventories are commonly deal with in three parts: raw materials, semi - finished and final product. For all these types of inventories, the companies should make stock audits and plans.

Inventory requires financial investment for the companies. The stock level may be a risk for the company due to costs such as ordering, storage, transportation, and holding. The idle stock creates additional costs for the company. On the other hand, the company doesn't want to face problems with a lack of stock (Tomak, 2013).

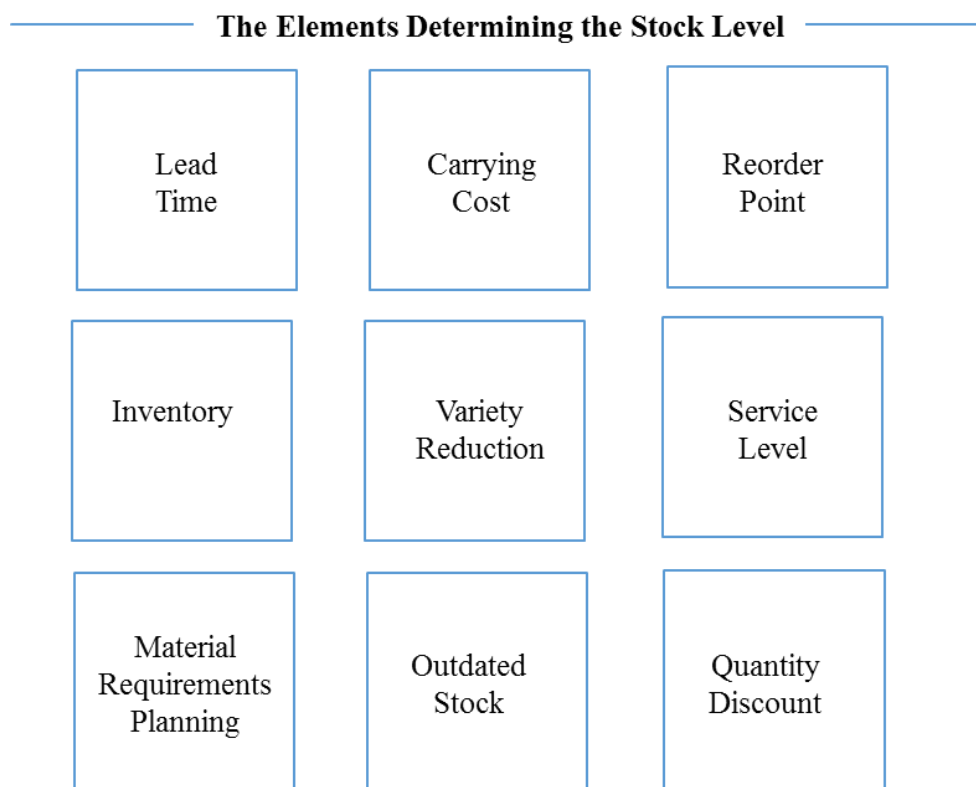
The reasons for holding inventory in companies can be examined under four headings: time, uncertainty, economics of scale, speculation (Tomak, 2013).

- Time: Delays and disruptions that may occur in the supply chain from the supplier to the end consumer push the business to keep stock (Bisen and Srivastava, 2009).
- Uncertainty: Stock is kept against uncertainties that may arise during the supply, demand and product supply process. Stocks that are kept above the need against uncertainties are called safety stocks (Bisen and Srivastava, 2009).

- Economics of scale: Businesses can keep stock on need to take advantage of the cost advantage provided by the scale economy (Bisen and Srivastava, 2009).
- Speculation: Future expectations directly affect the firms' decision to keep stock. For example on the expectation that raw material prices will increase, companies hold more than normal stocks (Sulak, 2008).

Many factors that affect the level of inventory level. It is detailed below in Figure 1.1.2.2.

**Figure 1.1.2.2. The Elements Determining the Inventory Level**



Source: Satrapyasad and Raghu 2010 - Prepared by Author

### **1.1.2.3. Accounts Payable Management**

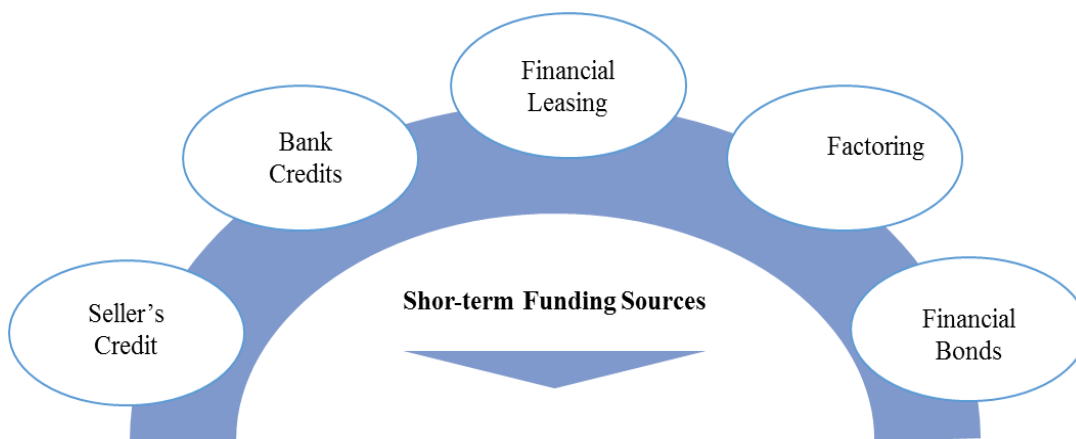
Account payables are in the short-term debts due to suppliers and they take part in the balance sheet. They are short-term payments. They are important parts of a company's balance sheet.

If the Accounts Payables increases that means the firms buy goods or services on credit. They don't prefer buying with cash. Accounts payable management is very critical because it has a direct impact on cash management. For optimizing the WCM, accounts payables management has a strategic and important role. Lots of companies focus on the strategy by extending payables as long as possible to maximize free cash flow. It can create a competitive advantage for the companies (Longenecker, Petty, Palich, and Hoy, 2013). This strategy varies from company to company because it can have both positive and negative results. For example, if the firms delay payments, they can use cash to make investments for gaining profit. It allows a company to reach an inexpensive source of financing but it has some risks. For example, if the company gets an offer that gives discounts based on early payments, by delaying payments companies can miss this opportunity and it leads costs (Deloof, 2003). By delaying payments, the companies can damage their reputation and it can lead to negative relationships with suppliers. On the other hand, paying debts to creditors on time can create a good relationship with suppliers (Fabozzi and Peterson, 2003).

They consist of the short-term financings of inventory purchases, accrued expenses, and other critical short-term operations. Account Payables Management is related to the processes, procedures, and practices operated by a firm in order to manage its trade credit purchases. That's why some activities within accounts payable functions such as invoicing process, procurement process, and vendor selection process become very important for the companies. If the firms can optimize these processes, it can help to increase cash flow and strengthen the firm's working capital (Part of Deloitte Research).

There are many factors that the firms may use as short-term funding source. It is detailed below in Figure 1.1.2.3.

**Figure 1.1.2.3. Short-term Funding Sources**



Source: Tomak, 2013; Aksoy and Yalçiner 2008- Prepared by Author

#### **1.1.2.4. Ratios of Working Capital Management**

Financial ratios are the most used tools in determining whether the working capital is sufficient. There are three types of ratios which help to measure WCM.

- Liquidity ratios,
- Efficiency ratios,
- Profitability ratios

Liquidity ratios are consist of current ratio, quick ratio, and cash ratio. These ratios show the ability of debt repayment by using the company's own current assets. When firms have financial problems, they can use their cash and pay liabilities easily by using their own cash. Thus, companies will pay their debts on time and their credibility in the market will not be damaged.

Current Ratio is calculated in finance literature using the following calculation:

Equation 1:

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

Current ratio shows financial health of the firms.

Quick Ratio is calculated in finance literature using the following calculation:

Equation 2:

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

Quick ratio means companies can convert quickly into cash. This ratios is also called acid-test ratio or liquidity ratio.

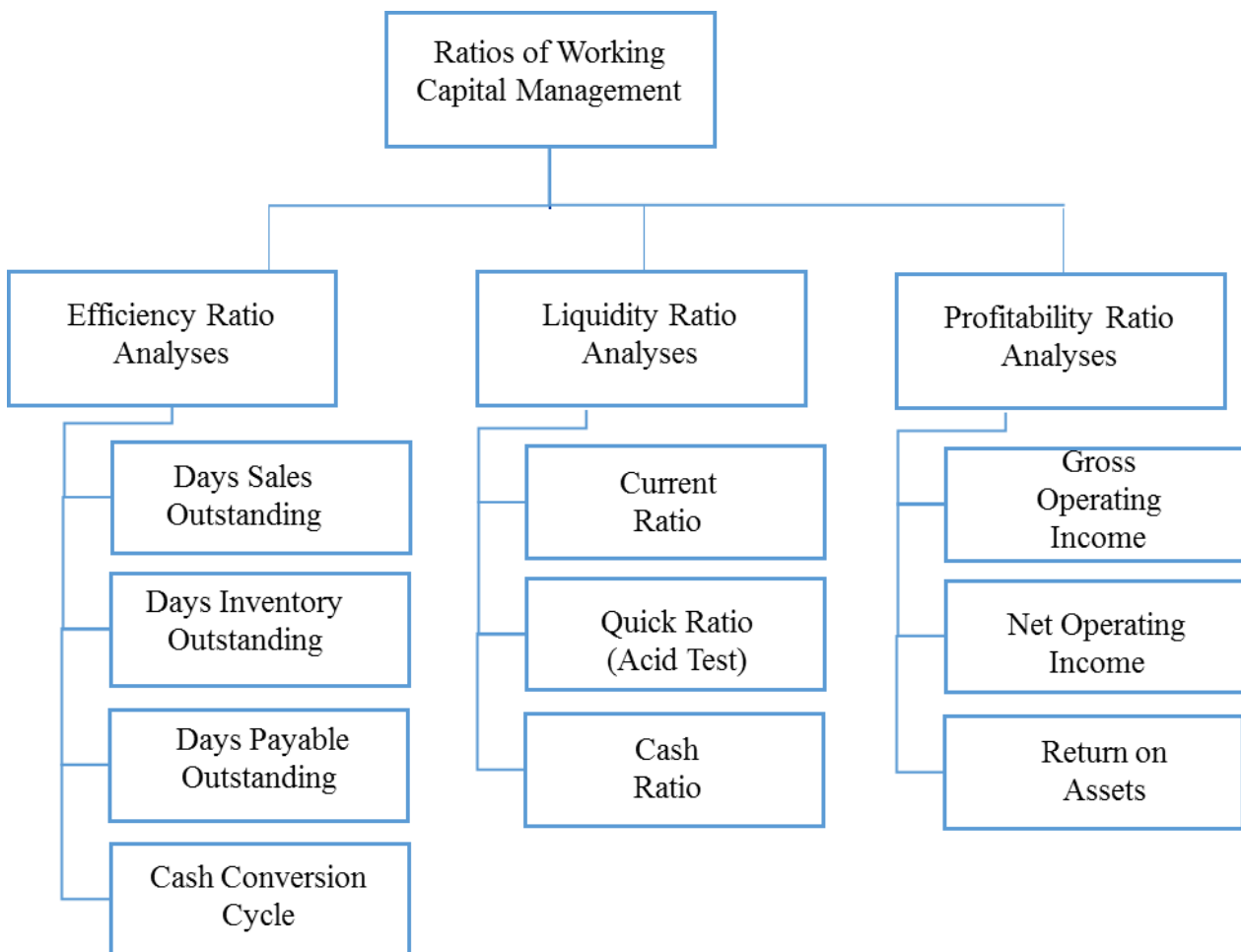
Cash Ratio is calculated in finance literature using the following calculation:

Equation 3:

$$\text{Cash Ratio} = \frac{\text{Cash and Cash Equivalents}}{\text{Current Liabilities}}$$

Efficiency ratios are consist of DSO, DIO, DPO and CCC. All these ratios help managers to measure real operational activity of the company. Profitability ratios are GOI, NOI and ROA. These ratios show how much profitable of the company. All of them are explained in detailed in the next chapter.

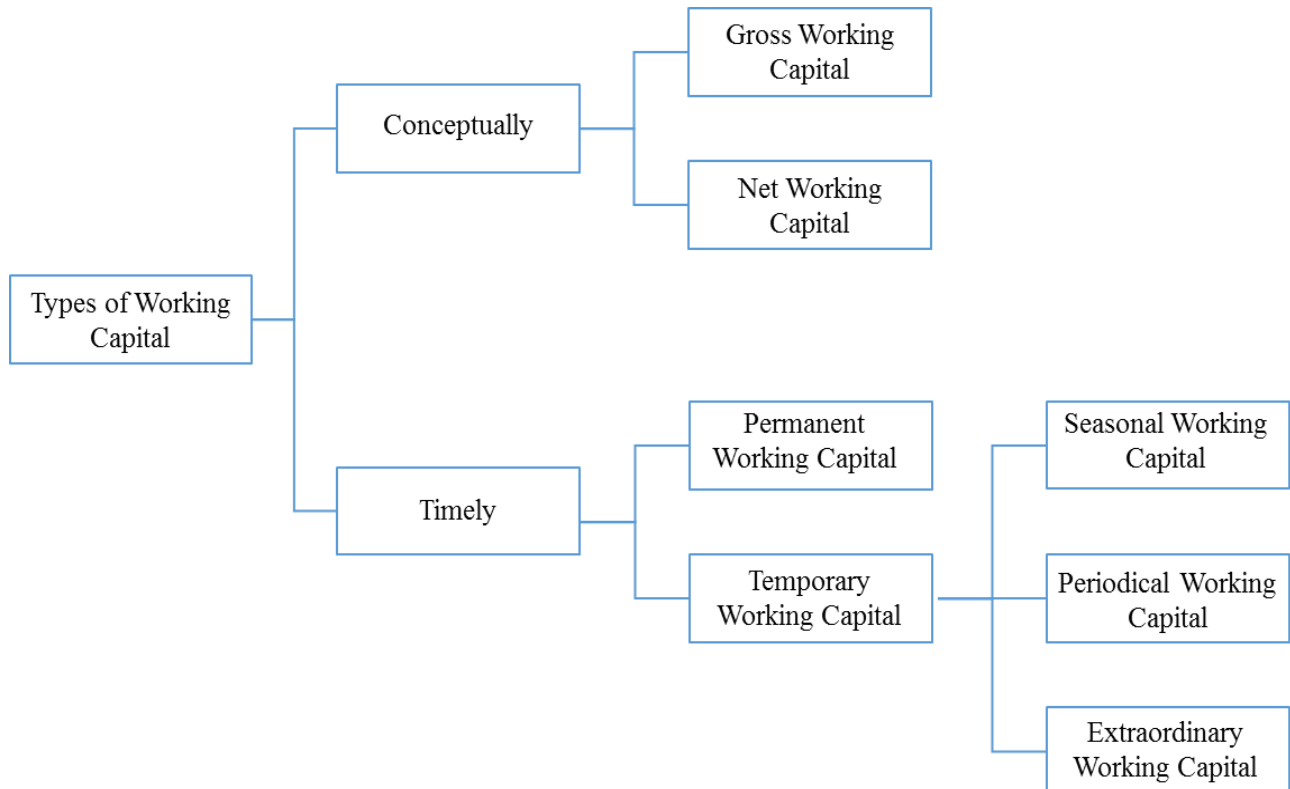
**Figure 1.1.2.4. Ratios of WCM**



Prepared by Author

### 1.1.3 Types of Working Capital Management

Figure 1.1.3 Types of Working Capital



#### 1.1.1.1. Gross Working Capital

All of the amount of current assets of a company are expressed as gross working capital. Cash, bank deposits, short-term marketable securities, other assets, accounts receivables and inventories are current assets. All of these items are called as gross working capital. In literature, it is known that current assets can be converted easily into cash within in a year (Paramasivan and Subramanian, 2009).

#### 1.1.1.2. Net Working Capital

In literature, the definition of the net working capital is the difference between current assets and the current liabilities. It signifies that the liquidity margin to meet the cash demands to maintain the daily operations. In the sense that it is used today, Guthmann and Dougall are defined working capital meaning for the first time.

It is defined as Net Working Capital in the below calculation:

Equation 4:

$$\text{Net Working Capital} = \text{Current Assets} - \text{Current Liabilities}$$

Therefore it can be said that WCM is like the lifeblood of a company. It can provide the success of the firm. If working capital is inefficient, a company will be in failure (Padachi et. al, 2008).

Current assets show the liquid assets of the business, and the short-term debts represent the liabilities with a maturity of less than 12 months. It is a short-term liquidity indicator. It helps firms to see how much cash they have to meet their operating expenses. In other words, net working capital; is expressed as the positive difference between current assets and short-term debts, also called temporary capital.

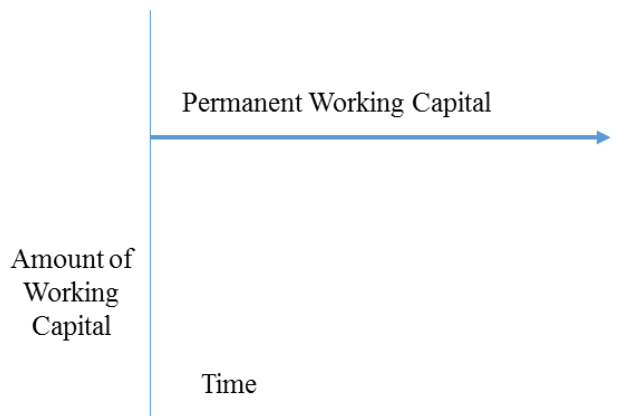
#### 1.1.1.3. Permanent Working Capital

Minimum amount of working capital that the business must maintain on a constant and continuous basis during the year is called permanent (continuous) working capital. In addition, it is defined as the capital used to meet the product demands of consumers with the input demand of the production department during periods of increased business volume, sales and production level (Sayilgan, 2006). As the operating volume of the enterprise increases, the need for continuous

working capital increases, while the operating volume decreases, the need for operating capital decreases (Tomak, 2013).

Permanent working capital is also known as fixed or hard core. It is stable. Permanent working capital appeals to the current assets needed on a continuing basis over the entire year. As it is shown in the Figure 1.1.3.3 the level of permanent working capital does not change in time.

**Figure 1.1.3.3 Permanent Working Capital**



Source: Paramasivan and Subramanian, 2009 - Prepared by Author

#### **1.1.1.4. Temporary Working Capital**

Another criterion in the classification of working capital; is the continuity and variability. Some of the working capital fluctuates with the effect of seasonal changes or policies pursued by the company management. The fluctuating working capital is called variable working capital. It is an additional working capital that is required in seasonal changes or in unpredictable situations.

In other words, temporary working capital refers to the total current assets that fluctuate during the period depending on the sales activity. Accordingly,

temporary working capital is additional amount. It must be kept above the fixed working capital level to meet demands that arise as a result of increases in the sales volume of the enterprises or the economic conjuncture.

Temporary working capital is fluctuating; sometimes increasing and sometimes decreasing. It is also called fluctuating, variable or seasonal working capital.

In periods when business volume increases, the additional capital required by businesses to meet seasonal demand is called seasonal working capital. Working capital may be needed in order to overcome the difficulties that may arise in case of extraordinary situations such as strikes, fires, floods, earthquakes and war. The resulting working capital in this case is considered as extraordinary working capital. Enterprises provide additional working capital in order to expand the business volume in addition to continuous working capital during periods when the conjuncture is positive and the business volume expands. This is called cyclical working capital.

## **SECOND CHAPTER**

### **2.1. LITERATURE REVIEW**

Working capital is an important part of total assets. Therefore finance managers spend most of their time over WCM. Due to this importance of working capital, it needs to be analysed in detail. Studies regarding working capital have increased in recent years.

It is observed that the studies generally focus on optimum inventory management, optimum accounts receivables and payables management and CCC. In addition, there are strong significant results between CCC and profitability. The studies have generally similar negative results. On the other hand, sometimes the positive or no significant relationships are observed. The main reason for this the relationship varies from country to country. Also it can be different because of the market conditions.

As a result of the literature research, regression and correlation analyses are mostly used, and in some studies panel data analysis is used.

#### **2.1.1. Working Capital Management Studies in the International Area**

In order to understand the differences between countries and market conditions; the studies are examined according to the countries' economic development status. International studies are described in two sections below: studies on developed countries and developing countries.

##### **2.1.1.1. Studies on Developed Countries**

WCM is one of the essential items for companies' financial management and success. To sustainable financial health and liquidity, many global managers and researchers care about WCM. That's why, there are many international

published studies and articles which describe the relationship between WCM and corporate profitability.

When studies on developed countries are examined, it is observed that generally the empirical results and findings are similar to each other. The studies show us that there is a significant negative relationship between profitability and liquidity.

The studies on developed countries' are stated below in order of date.

Jose et al. (1996) examines the relationship between WCM and profitability in the study of 54.368 American companies for the periods between 1974 and 1993 by using ROA and ROE as dependent variables and CCC as an independent. Based on his paper, there is a negative relationship between CCC and corporate profitability which means lower CCC, higher profitability.

Similarly, Shin and Soenen (1998) examine a sample of 58.985 American firms for the periods between 1975 and 1994. They use gross operating profit as a dependent variable, net trade cycle. They find similar results with Jose et al. Based on their research; there is a negative relationship between NTC and profitability.

Deloof (2003) studies 1.009 Belgian non-financial firms, for the periods between 1992 and 1996. He finds a strong negative relationship between GOI and DSO, DIO and DPO. He uses correlation and regression analysis.

Smilarly, Lazaridis and Tryfonidis (2006) investigate the effect of the CCC on GOI in 131 firms on the list of Athens Stock Exchange for the periods between 2001 and 2004. Also they reach the result of a significant negative relationship between profitability and CCC.

Garcia-Teruel and Martinez-Solano (2007) examine the relationship between profitability and CCC by using ROA as a dependent variable. The study on a sample of small and medium-sized firms in Spain for the periods between 1996 and 2002. They find a negative relationship between profitability and receivable days.

There are many other studies with similar results as a negative relationship between WCM and profitability. For example in the study which includes

corporations in construction and material, and electronic sectors from Singapore, a strong negative relationship between CCC and ROA is found by Mansoori and Muhammad, 2012.

Last, In Gill et al. (2010)'s study, a sample of 88 U.S manufacturing firms for the periods of 3 years between 2005 and 2007 are enquired to find a relation between GOI and CCC. In Gill's study there is a positive relationship between profitability and CCC. This is a different result from the others. As I mention above, loads of researchers find a negative relation between profitability and CCC. According to Gill et al.'s paper, there is a negative relationship between profitability (measured by GOI) and average days of accounts receivable. Therefore, higher profits are directly related to managing accounts receivable way. Gill et al. emphasize that their study is limited which means it has a small size of data so the results of the relationship between CCC and profitability are different from previous researches.

#### **2.1.1.2. Studies on Developing Countries**

Eljelly (2004) tries to understand empirically the effect of liquidity on the profitability by using correlation and regression analysis. He uses the CCC as a dependent variable and current ratio as independent ones. He studies a sample of 929 Saudi Arabia joint-stock companies for the periods between 1996 and 2000. He finds a strong negative relation between the firm's profitability and the current ratio. In addition to this, he indicates that firm size has a significant effect on profitability. Also he states that CCC has more impact as a liquidity measure on profitability than the current ratio.

Afza and Nazir's (2007) study the effects of profitability with a different variable which is the WCM policies. The paper is investigated in a sample of 263 public companies from Karachi Stock Exchange for the periods between 1998 and 2003. They find that there is a negative relation between the aggressiveness of working capital policies and the profitability of the company.

Raheman (2007) investigates the effect of liquidity on the profitability of companies which is related to sample data of 94 Pakistani companies listed on the

Karachi Stock Exchange for the periods between 1999 and 2004. Based on his paper, a lower CCC leads to higher profitability. Also there is a negative relationship between liquidity and profitability. In Pakistani there are some another studies with similar results. One of them includes 50 listed non-financial companies on the Pakistani Stock Market and Karachi Stock Exchange is investigated from the year 2005 to 2014 (Bagh, Nazir, Asif Khan, Atif Khan, Razzaq 2016). The findings imply that there is a negative relationship between CCC and profitability. The results are following other studies before mentioned. The other study focuses on pharmaceutical sector. The results indicate that there is a negative relationship between CCC and ROE and ROI (Ahmed, Awan, Safdar, Hasnain and Muhammad Kamran, 2015).

Likely, Dong and Su (2010) focus on 130 Vietnam companies in 3 years period (2006-2008) to understand the relationship between WCM and profitability. A significant and strong negative relationship is found.

Hayajnen ve Yassine's (2011) study on 53 manufacturing firms that are listed on the Oman Stock Exchange from 2000 through 2006 to understand the efficiency of WCM on profitability by using Pearson Correlation method and OLS regression methods. The findings show significant and negative relations between WCM and profitability.

Padachi (2006) studies on the relationship between CCC and profitability for 58 small manufacturing firms on Mauritius using a sample of 348 firm years in six years. The dependent variable is Return on Total Assets and the independent is CCC. The results show that there is a negative correlation between ROTA and the individual components of the CCC, but there is a positive correlation between ROTA and the CCC as a whole.

There are lots of different researches with similar variables and negative results in developing countries. For example a study on the relationship between liquidity and profitability on manufacturing firms in Nigeria (Gideon Tayo Akinleye and Joseph Segun Ogunleye in 2019). In addition to this, 66 firms in Tehran Stock Exchange over the period 2008 and 2012 are examined and achieved a result that there is a negative relationship between CCC and profitability (Hassan

Ghodrati and Jaber Ghanbari, 2014). There are loads of other studies with negative results (Tapan P Bagchi, 2014, Sam Ngwenya 2010, Gorondutse A.H., Ali R.A., Abubakar A., Naalah M.N.I. 2017).

On the other hand, Sharma and Kumar (2011) found a positive relationship between WCM and the profitability of 263 non-financial Indian companies which are listed on the Bombay Stock Exchange between the period of 2000 and 2008. They use the OLS regression method when they empirically investigate the data. Although they find a negative relation between days inventory outstanding and profitability; the results show that the relationship between CCC and firm profitability is positive. Also there is a study in Vietnam that has similar results with Gill et al.'s and Sharma and Kumar's. The paper has investigated the 69 public firms on the Ho Chi Minh Stock Exchange (HOSE) for 2014 and 2016 by Le, H. L., Vu, K. T., Du, N. K., & Tran, M. D. (2018). The findings imply that there is WCM positively impacts ROA and ROE. In addition to all of them, in Pakistan it is aimed to understand the impact of WCM on profitability of electrical equipment sector of KSE listed companies. The results show significant and positive relationships between ROA and WCM (Khalid, Saif, Gondal and Sarfraz, 2018).

In conclusion, the relationship between WCM and profitability has been investigated in different geographical regions in similar variables. Most of the researchers seem to agree that there is a negative relationship between WCM and profitability.

### **2.1.2. Working Capital Management Studies in Turkey**

The subject of "Impact of effective WCM on profitability" is investigated in loads of different countries for a long time. There are loads of studies that examine that there is a correlation between WCM and profitability of companies in Turkey.

Yücel and Kurt (2002) examine the relationship between profitability and CCC, liquidity and financial leverage. They study on 167 corporations in Turkey.

The data covers the periods between 1995 and 2000. They find the result that the CCC is positively related to liquidity and negatively related to ROA and ROE.

In the sample of 5.843 manufacturing firms for the periods between 1998 and 2007, Şamiloğlu and Demirgüneş (2008) study the effects of WCM and profitability and they find that there is a positive relationship between sales growth and profitability. In addition to this, they reach a result that there is a negative relationship between accounts receivables/inventory period/leverage and firm profitability.

Uyar (2009) studies 166 corporations which are from different sectors such as food, paper, metal products, textile and chemistry. The companies are listed on the BIST for the year 2007. He shows that there is a negative relationship between the CCC and profitability. Also firm size harms CCC length. That means small size firms have longer CCC length than large size firms.

Karaduman et al (2010) examine the effects of WCM on the profitability of 140 non-financial companies in the BIST for the period of 2005 and 2008. ROA is used as a dependent variable; CCC and its components are used as independent variables. They find that there is a negative relationship between ROA and number of days accounts receivable, accounts payable and inventory. As a result, if a company reduces CCC, it will lead up to more profit.

Akbulut (2011) studies the relationship between WCM and firm profitability of firms in the manufacturing sector which are listed in the BIST between 2000 and 2008. WCM is measured by CCC and to understand the impact on profitability; Akbulut uses ROA as a dependent variable and he achieves a strong negative relation.

Aygün (2012) investigates the effect of WCM on firm profitability in the scope of 107 manufacturing firms for the periods between 2000 and 2009. He uses ROA as a dependent variable and achieves a negative relation between ROA and components of WCM.

Vural, Sökmen, & Çetenak (2012) investigate the impact of WCM components on a firm's profitability with a sample of 75 manufacturing firms for the periods between 2002 and 2009 by using panel data analysis. They use GOI and

Tobin Q as dependent variables and CCC as an independent. The results describe that if the companies decrease the collection period of accounts receivable and CCC, they can reach higher profits.

In Dursun ve Ayriçay (2013)'s paper, a sample of 120 manufacturing firms for the periods between 1996 and 2005 are studied. They find that there is a negative relationship between gross profit and components of WCM.

As can be seen above, all the studies in Turkey are performed on companies from different sectors which are listed on BIST. All of them use similar variables in their researches. Generally GOI is used as a dependent variable and CCC as an independent. In addition to this, most studies in Turkey have similar results which show that there is a negative relationship between profitability and WCM components. There are many different studies have reached similar results in Turkey. The sectors and periods are different but the result show there is a negative relationship between WCM and profitability (Rıdvan Keskin, Füsün Gökalp, 2016, Selçuk Kendirli, Fatih Konak 2014, Mehtap Öner 2016, Ilker Yılmaz 2015, Samet Evcı and Nazan Şak 2018).

On the other hand, some studies have not statistically significant results in Turkey. For example, there is a study that investigates the relationship between WCM and profitability in 11 Turkish retail firms which are listed on the BIST for 2009 and 2013. The findings are not compatible with the literature. The results show that there is no significant relationship between WCM and profitability (Toraman and Sönmez, 2015). Similarly in Atmaca's (2016) study which examines the relationship WCM and profitability in 24 business in chemicals, petroleum, rubber and plastic products sector in BIST with consistent data between the period of 2009 and 2015, the obtained results show that there is no statistically significant relationship between variables. Also there is a study that achieves a positive relationship between CCC and ROA and no relationship between ROE and CCC (Topaloğlu and Nur, 2016). These studies' results do not support the general results in the literature.

To sum up, the studies are summarized above show that while there is a negative relationship between CCC and profitability in most countries' studies,

there is a positive relationship in other studies. A positive relationship between CCC and profitability means that the level of investment in working capital increases as the CCC increases. If the cost of investment in working capital is higher than the cost of inventory and being flexible in the receivable period, the profitability will be lower (Deloof, 2003). Hence, the relationship between WCM and profitability depends on how WCM components are affected.

## **THIRD CHAPTER**

This thesis aims to examine impacts of WCM on profitability. Considering all studies, it is targeted to bring some new statistical analysis to the literature. All analysis methods are explained in detailed in the next parts.

In that part, it is organized that data and sampling description, measurement and formulas of variables, hypothesis of models, data analysis methods.

When the literature is examined; most studies are conducted in the manufacturing sector from BIST companies. There are a few studies that analysed impact of WCM in the retail and wholesale industry. That's why the focus of this study is the retail and wholesale industry.

### **3.1. DATA AND SAMPLE DESCRIPTION**

In this study, it is used the financial data of the public retail and wholesale firms. The data comprises the 11 years between 2008 and 2018. I use Bloomberg to download all the financial statements.

The sample includes all retail and wholesale companies in BIST. There are 19 firms on the list. 4 firms are eliminated from the data because these 4 firms' activities are different from others and the results of ratios are so high. Because of the business differences meaningful ratios can't be reached so I exclude the 4 companies from data. (Their names are Milpa Ticari ve Sinai Ürünler Pazarlama Sanayi ve Ticaret A.Ş, Metal Gayrimenkul A.Ş, Pergamon Status Dis Ticaret A.Ş and Tgs Dis Ticaret A.Ş )

There are 15 different companies. Their names are in alphabetical order.

**Table 3.1.1: BIST Retail and Wholesale Companies of the Study**

<b>Code</b>	<b>Name of Company</b>
1 ADESE	Adese Alışveriş Merkezleri Ticaret A.Ş.
2 BIMAS	Bim Birleşik Mağazalar A.Ş.
3 BIZIM	Bizim Toptan Satış Mağazaları A.Ş.
4 CRFSA	Carrefoursa Carrefour Sabancı Ticaret Merkezi A.Ş.
5 MAVI	Mavi Giyim Sanayi ve Ticaret A.Ş.
6 MEPET	Mepet Metro Petrol ve Tesisleri Sanayi Ticaret A.Ş.
7 MGROS	Migros Ticaret A.Ş.
8 SOKM	Şok Marketler Ticaret A.Ş.
9 TKNSA	Teknosa İç ve Dış Ticaret A.Ş.
10 VAKKO	Vakko Tekstil ve Hazır Giyim Sanayi İşletmeleri A.Ş.
11 DOAS	Dogus Otomotiv Servis ve Ticaret A.Ş.
12 INTEM	Intema Insaat ve Tesisat Malzemeleri Yatırım ve Pazarlama A.Ş.
13 SANKO	Sanko Pazarlama İthalat İhracat A.Ş.
14 SELEC	Selcuk Ecza Deposu Ticaret ve Sanayi A.Ş.
15 UZERB TI	Uzertas Boya Sanayi Ticaret ve Yatırım A.Ş.

Source: <https://www.kap.org.tr/tr/Sektorler>

The all variables are shown in the tables below.

**Table 3.1.2: Dependent Variables of the Study**

<b>Abbreviation</b>	<b>Dependent variables</b>
GOI	Gross Operating Income
NOI	Net Operating Income
ROA	Return on Assets

**Table 3.1.3: Independent Variables of the Study**

<b>Abbreviation</b>	<b>Independent variables</b>
DSO	Days Sales Outstanding
DIO	Days Inventory Outstanding
DPO	Days Payable Outstanding
CCC	Cash Conversion Cycle (CCC)

**Table 3.1.4: Control Variables of the Study**

<b>Abbreviation</b>	<b>Control variables</b>
SG	Sales Growth
FD	Financial Debt
CS	Company Size

The variables, which have been used in the analysis of this study, have been summarized as follows:

I use 3 different ratios to measure firm profitability. The indicators are gross and net operating income (GOI, NOI), return on assets (ROA).

Gross operating income (GOI) is calculated in finance literature using the following calculation:

Equation 5:

$$GOI = \frac{\text{Net Sales} - \text{Cost of Goods Sold} + \text{Depreciation \& Amortization}}{\text{Total Assets} - \text{Financial Assets}}$$

For lots of companies, the share of financial assets is very high that's why it is preferable to eliminate the financial assets from total in formulas to measure real profitability of operating (Deloof, 2003). In our sample, the average share of financial assets in total assets is 14%. This is a very high and significant percentage of total assets. Especially the cash and equivalents share is remarkable.

Moreover I want to separate the financial activity from operational because this situation may affect the firm's overall profitability so in my research, I eliminate the financial assets from total assets.

The financial assets in our sample can be listed in below:

- Cash and Equivalents,
- Marketable Securities (Current and Non-Current),
- Derivative Assets (ST and LT),
- LT and ST Investments,
- Investment Securities Available For Sale

Net operating income (NOI) is defined in the below calculation:

Equation 6:

$$NOI = \frac{\text{Net Sales} - \text{Cost of Goods Sold}}{\text{Total Assets} - \text{Financial Assets}}$$

Return on assets (ROA) is defined in below calculation:

Equation 7:

$$ROA = \frac{\text{Net Income}}{\text{Average Assets}}$$

Main independent variable of the study is CCC. CCC is calculated in finance literature using the following formula;

Equation 8:

$$CCC = DSO + DIO - DPO$$

$$CCC = \text{number of days accounts receivable} + \text{number of days inventory} \\ - \text{number of days accounts payable}$$

The components used in the CCC;

DSO is defined in the below calculation:

Equation 9:

$$DSO = \frac{\text{Average Accounts Receivable}}{\text{Sales}} * 365$$

DIO is defined in below calculation:

Equation 10:

$$DIO = \frac{\text{Average Inventory}}{\text{Cost of Goods Sold}} * 365$$

DPO is defined in below calculation:

Equation 11:

$$DPO = \frac{\text{Average Accounts Payable}}{\text{Cost of Goods Sold}} * 365$$

In Days Sales/Inventory/Payable Outstanding formulas I use average Receivable/Inventory/Payable. Average means the average of the current year and prior year amounts. The aim of using average in balance sheet items is making smooth the analysis. The beginning and end of the years can be very different from each other. To make the analysis more smooth most of the people use average in their studies.

Furthermore, some control variables are used in analysis. The control variables are SG, FD and CS.

For SG of the company;

Equation 12:

$$SG = \frac{\text{This year's sales} - \text{previous year's sales}}{\text{Previous year's sales}}$$

For FD of the company;

Equation 13:

$$FD = \text{Financial Debt} / \text{Total Assets}$$

For the company size (LN \_ Assets);

Equation 14:

$$LN\_Assets = \text{Natural Logarithm of Total Assets}$$

All variables are calculated by using the Balance and Income Statements of analyzed companies.

### **3.2. METHODOLOGY**

My thesis is attempted to empirically analyse the impact WCM on profitability. All data is tested with panel data analysis in all hypotheses. I develop the 4 hypotheses which are listed below.

H1: There is a negative relation between DSO and profitability.

H2: There is a negative relation between DIO and profitability.

H3: There is a negative relation between DPO and a firm's profitability.

H4: There is a negative relation between the CCC and the profitability of firms.

All models aim to examine the relationship between DSO, DIO, DPO and GOI.

In addition to these models, I also use NOI and ROA as a dependent variable in my paper. I add related tables to the appendix part. As you will see, using the dependent of NOI, the similar results to the GOI, are achieved. Also, I use company size (CS), sales growth (SG) and financial debt (FD) as control variables in the regressions.

### **3.3. PANEL DATA ANALYSIS**

In this thesis, all data is analysed with descriptive and correlation analysis. Next, regression analysis is used to explain each model with the hypotheses tested. Both Ordinary Least Square Method (OLS) and Fixed Effect Regression methods are used in the research.

Ordinary Least Square Method (OLS) estimates the impact by minimizing the sum of the squares in the difference between predicted values of the dependent variables. A fixed effects regression is an estimation technique used in a panel

data analysis that allows to control for time-invariant unobserved individual features that can be correlated with the observed independent variables. The fixed effect method controls for the change in data over time and firm. In my study, FE method is used to control for the firm specific and time variant variables.

In line with the purpose of this study, it has been established, five models.

Model 1:

$$GOI_{i,t} = \beta_0 + \beta_1 \text{Ln\_Assets}_{i,t} + \beta_2 \text{FD}_{i,t} + \beta_3 \text{SG}_{i,t} + \beta_4 \text{DSO}_{i,t} + \varepsilon_{i,t} \quad (1)$$

Model 2:

$$GOI_{i,t} = \beta_0 + \beta_1 \text{Ln\_Assets}_{i,t} + \beta_2 \text{FD}_{i,t} + \beta_3 \text{SG}_{i,t} + \beta_4 \text{DIO}_{i,t} + \varepsilon_{i,t} \quad (2)$$

Model 3:

$$GOI_{i,t} = \beta_0 + \beta_1 \text{Ln\_Assets}_{i,t} + \beta_2 \text{FD}_{i,t} + \beta_3 \text{SG}_{i,t} + \beta_4 \text{DPO}_{i,t} + \varepsilon_{i,t} \quad (3)$$

Model 4:

$$GOI_{i,t} = \beta_0 + \beta_1 \text{Ln\_Assets}_{i,t} + \beta_2 \text{FD}_{i,t} + \beta_3 \text{SG}_{i,t} + \beta_4 \text{CCC}_{i,t} + \varepsilon_{i,t} \quad (4)$$

Model 5:

$$GOI_{i,t} = \beta_0 + \beta_1 \text{Ln\_Assets}_{i,t} + \beta_2 \text{FD}_{i,t} + \beta_3 \text{SG}_{i,t} + \beta_4 \text{DSO}_{i,t} + \beta_5 \text{DIO}_{i,t} + \beta_6 \text{DPO}_{i,t} + \varepsilon_{i,t} \quad (5)$$

Where;

FD: Financial Debt,

SG: Sales Growth,

DSO: Days Sales Outstanding,

DIO: Days Inventory Outstanding,

DPO: Days Payable Outstanding,

CCC: Cash Conversion Cycle:  $DIO+DSO-DPO$ ,

GOI: Gross Operating Income,

$\beta$ : Regression Coefficient,

e: Error Term,

i: Number of Firms,

t: Number of Years

As it is seen in the models above, the structure of models has been comprised of four different independent variables and three control variables.

### **3.4. EMPIRICAL RESULTS**

This part shows the empirical evidence from descriptive, correlation and regression analyses.

The analyses are conducted to Eviews statistical software. Data is analysed with the pooled regression. All the components are tested with OLS and the Fixed Effects Regression.

#### **3.4.1. Descriptive Analysis**

Table 3.4.1 shows descriptive analyses and it reveals the mean, standard deviation, median of data. Also it gives minimum and maximum values. This descriptive statistics involve 15 firms for 11 years from 2008 to 2018. There are 137 firm year's observations in total. Researchers use descriptive statistics to get a interpretation of the characteristics of variables.

GOI is on average 44% while the median is 40%. The results of the NOI is very close to GOI. The average 41% and the median is 37%. It seems that the results

of Return on assets are very lower than the GOI and NOI. ROA is on average 3% and the median value is the same.

The average CCC is 22.1 days on average (median is 11.1 days). That means some companies need 22 days to make payment to their supplier and get money from clients. Companies' average accounts receivable period is 38.6 days while the median is 15.7 days. The inventory period, which means average days firm waits to sell inventory, is 61.6 days (median is 41.2 days). Accounts Payable Period is on average 78.1 days and median is 76.7 days.

The maximum value of DSO is 136, DIO is 301 and DPO is 290. The minimum value of DSO, DIO and DPO are 2, 1 and 7 respectively. It means some firms have a long time to make payments. Some of them prefer pay in advance. To compare the average period of account payables and receivables, it will be seen that there is a gap of 39 days on the side of payables. It means when companies get cash from customers, they prefer to wait 39 days to give payments to suppliers.

Mean sales growth is 12%, while median sales growth is closed to mean, at 13%. Mean financial debt is 15% (median is 2%), and finally the average firm size of 2.90. I use logarithm of total assets for measure firm size (median is 2.92). All results of descriptive statistics in the analysis are in Table 3.4.1.

### **3.4.2. Correlation Analysis**

All results of correlation statistics in the analysis are shown in Table 3.4.2.

The findings confirm hypotheses of the study which expect negative relations. The results show a negative relation between GOI and DSO, DPO and CCC. On the other hand, there is a positive relationship between DIO and GOI. As can be seen, GOI is negatively related to DSO, DPO and CCC with a correlation of -0.5643, -0.1228 and -0.1144 respectively. In addition to this, GOI is positively related to DIO with a correlation of 0.2084.

The relationship between the NOI and WCM components is like gross operating incomes'. Regarding control variables; there are positive relations between sales growth / financial debt /company size and GOI.

To sum up, the results indicate that despite ROA does not have stronger correlations with working capital components; GOI and NOI are strongly correlated to DSO, DIO and DPO.

### **3.4.3. Regression Analysis**

This chapter exemplifies regression results. It compares OLS and Fixed methods. There are five models to investigate the effect of WCM on profitability. In each model one of the independent variables (DSO, DIO, DPO, and CCC) and all of the control variables (SG, FD and CS) are regressed individually against GOI. In addition to this, NOI and ROA are used as dependent variables with the same independent and control variables as mentioned above. The determinants are investigated for all 137 firm-year observations.

Table 3.4.3 represents the results of the OLS regression. In the same way, five regression equations applied to analyse the impact of DSO, DIO, DPO and CCC on the profitability (GOI). In all models, the probability values of the company size are insignificant, they are higher than 10%. If we look at the details of the models, we will see the other differences. In Table 3.4.3, in Model 1, except for the coefficients of financial debt and company size, which are control variables, the other variables' probability values are quite significant (Constant 0%, SG 0% and the independent variable DSO 0%). Again a negative relationship between DSO and GOI is observed in the regression with OLS. In model 2, only two variables probabilities are significant (SG 0% and DIO 2%). The others are insignificant because the probability values are higher 10%. In Model 3, the probabilities of DPO and company size are not significant. In Model 4, except for the company size's probability value, all variables have significant probabilities. We reach a result that is similar to the Fixed Method. A negative relationship between WCM and CCC (-

0.0010) is observed. Then again, according to the table, in all five models (Model 1-5) the adjusted R square values are 41%, 22%, 19%, 21% and 41% respectively. That means they are sufficient for significance.

Table 3.4.4 shows the results of the Fixed Effect Regression of five models with the dependent variable of GOI. Independent variables are mentioned above DIO, DSO, DPO and CCC. In addition to this SG, CS and FD control variables are investigated in the regression. The coefficient of DSO is highly significant (probability 0.0002) and negative (-0.0048) which means there is a negative relation between DSO and GOI. If there is a 1-day increase in DSO, it will lead to a 0.0048 decline in GOI. In addition to this, the regression results are similar to days inventory outstanding (DIO) and days payable outstanding (DPO) when we look at the relationship between GOI and DIO, DPO. If there is a 1-day increase in days inventory outstanding, it will lead to a 0.0030 decline in GOI. In the same way, a 1-day increase in days payable outstanding will have resulted in a 0.0012 decline in GOI. Furthermore the profitability of the company which is measured by GOI increases with SG and FD. The coefficients of these variables are highly significant and positive. Also, the findings of this model show that GOI decreases with company size which is the logarithm of assets. The probability of company size is zero which means highly significant and negative.

According to Deloof's (2003) paper, less profitable firms don't prefer to pay invoices in advance. They try to gain time and wait. That's why a negative relationship between DPO and profitability is observed. In addition to them, Deloof states that, if your sales decline, you will have lower profits and more inventory so which means there is a negative relationship between DIO and GOI.

In Table 3.4.4, in all equations which are mentioned above, the adjusted R square value is higher than %84 and it is quite sufficient for significance because it is very high. Hence, the regression model is meaningful and explanatory. Also in Table 3.4.4, in all five models the probability values are between 0%- 3% which means all equations with the fixed effect model are significant.

One difference between OLS and fixed effects regression is DIO relation. In OLS, in Model 2 GOI increases with the DIO but in fixed effects model regression GOI decreases with DIO. Also, all variables in five equations (models), have significant probability values in the Fixed Effect Regression Model. However, the variables in OLS regressions don't verify significant probability values in any equation. Also, the adjusted R square values of the fixed effects regressions are higher than OLS regressions. That means the models with Fixed Effects Method are more descriptors.

In Table 3.4.5 (OLS), and 3.4.6 (Fixed Effect Regression Method) NOI is investigated as a dependent variable. Other independent and control variables are the same as the regressions mentioned above. Results are almost the same as other regressions (with the dependent variable of GOI).

In Table 3.4.7 (OLS), and 3.4.8 (Fixed Effect Regression Method) ROA is investigated as a dependent. Other independent and control variables are the same as the regressions mentioned above. The p-values of constant-coefficient values are not significant in two tables. According to the Table 3.4.8, in all five models (Model 1-5) the adjusted R square values are 18%, 25%, 23%, 15% and 27% respectively. That means they are sufficient for significance. On the other hand, the adjusted R square values in the Table 3.4.7 (OLS) change between 2% and 8%. That means they are sufficient for significance but not as good as Fixed Effect Regression Model.

In Table 3.4.7, only in Model 3, the p-value of DPO is significant and imply that there is a negative relationship between ROA and DPO (probability 0.0015 and the coefficient value is -0.0008). In other models the p-value of independent variables are not significant.

In Table 3.4.8, in Model 1, 2 and 3 the p-values of independent variables are highly significant and imply that there are negative relations between ROA and DSO, DIO and DPO. The coefficient of DSO is significant (probability 0.0296) and negative (-0.0022) which means there is a negative relation between DSO and

ROA. The coefficient of DIO is highly significant (probability 0.0001) and negative (-0.0021). Also the coefficient of DPO is highly significant (probability 0.0005) and negative (-0.0015).

In this research, I find a significant negative relationship between GOI and DSO, DIO and DPO. Also, the results of the regression analysis are consistent with other evidence in the literature such as Deloof 2003, Eljelly 2004, Shin and Soenan 1998, who find a strong negative relationship between the measures of WCM. Also our empirical results which show the negative relationship between ROA and CCC are consistent with Garcia-Teruel and Martinez-Solano, 2007, Jose et al. 1996.

## CONCLUSION

WCM is particularly important in all firms. In this thesis, the purpose of my research is to provide empirical evidence about the effects of WCM on the profitability of retail and wholesale companies operating in Turkey and listed on BIST. For this reason, we collect a panel consisting of 15 firms covering the period 2008-2018.

Our findings suggest companies can increase profitability by reducing DSO, DIO and DPO. Similarly, if a company has short CCC, this can give companies more profits. According to previous studies (Shin and Soenen, 1998, Deloof, 2003, Lazaridis and Tryfonidis, 2006, Jose et al. 1996 and other researchers who achieved similar results detailed above), the analyses confirm WCM is important for companies to gain more profit in retail and wholesale firms.

To sum up, I find a significant negative relationship between GOI, NOI, ROA and DSO, DIO and DPO. We cannot, however, confirm that the SG and FD affect negatively GOI and NOI. There are positive relationships between GOI, NOI, and SG and FD. In addition, company size affects the firm's profitability. We find a negative relationship between CCC and company size.

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## APPENDIX

**Table 3.4.1 Descriptive Analysis**

The table presents a summary statistic for the variables, which have been used in the study. The sample has been covered the period starting from the year 2008 to the year 2018 and has 137 observations of the 15 Turkish retail and wholesale companies.

	Mean	Std. Dev.	Minimum	Median	Maximum
Gross Operating Income	0,44	0,34	0,02	0,40	1,99
Net Operating Income	0,41	0,33	0,02	0,37	1,92
Return on Assets	0,03	0,12	-0,31	0,03	1,02
Days Sales Outstanding	38,6	42,0	1,8	15,7	136,4
Days Inventory Outstanding	61,6	59,6	0,2	41,2	301,1
Days Payable Outstanding	78,1	40,0	7,4	76,7	289,7
Cash Conversion Cycle	22,1	55,6	-66,6	11,1	178,9
Sales Growth	0,12	0,18	-0,69	0,13	0,61
Financial Debt	0,15	0,19	0,00	0,02	0,91
Fixed Financial Assets	0,03	0,06	0,00	0,00	0,27
Company Size (Ln_Assets)	2,90	0,67	0,56	2,92	4,04

Source: Bloomberg financial database & author analysis

**Table 3.4.2 Correlation Coefficients Analysis**

15 Turkish Retail and Wholesale Firms, 2008–2018: 137 Firm-year Observations

	<b>Net Operating Income</b>	<b>Return on Assets</b>	<b>Days Sales Outstanding</b>	<b>Days Inventory Outstanding</b>	<b>Days Payable Outstanding</b>	<b>Cash Conversion Cycle</b>	<b>Sales Growth</b>	<b>Financial Debt</b>	<b>Company Size (Ln_Assets)</b>
Gross Operating Income	0,9996	0,0366	-0,5643	0,2084	-0,1228	-0,1144	0,3895	0,2619	0,1630
Net Operating Income		0,0384	-0,5546	0,2097	-0,1229	-0,1056	0,3947	0,2647	0,1615
Return on Assets			-0,0271	-0,1105	-0,2381	0,0325	-0,1515	-0,1213	0,0316
Days Sales Outstanding				-0,1776	0,2942	0,3530	-0,1507	-0,3036	-0,2735
Days Inventory Outstanding					0,4075	0,6439	-0,0992	0,3914	-0,2287
Days Payable Outstanding						-0,0609	-0,1498	-0,1204	-0,2232
Cash Conversion Cycle							-0,1122	0,2767	-0,2908
Sales Growth								0,0566	0,2598
Financial Debt									0,2141

**Table 3.4.3 Profitability and Working Capital: OLS Regressions**

The table represents the results of the Ordinary Least Square Model regression of five versions of the company profitability indicators. The sample has been covered the period starting from the year 2008 to the year 2018. The dependent variable is company profitability measured as gross operating income (GOI).

Gross operating income is (net sales-cost of goods sold + depreciation & amortisation) / (total assets-financial assets). Days sales outstanding is (average accounts receivable/sales)\*365. Days inventory outstanding is (average inventory/cost of goods sold)\*365. Days payable outstanding is (average accounts payable/cost of goods sold)\*365. The cash conversion cycle is (No. of days accounts receivable + No. of days inventories-No. of days accounts payable). Sales growth is (this year's sales-previous year's sales)/previous year's sales. Financial debt is financial debt/total assets. Company size is the logarithm of total assets.

	1	2	3	4	5
<b>Constant Coef</b>	0,6125 (0,0000)***	0,1119 (0,3974)	0,2983 (0,0377)**	0,3596 (0,0053)***	0,5013 (0,0002)***
<b>Sales Growth</b>	0,6418 (0,0000)***	0,7435 (0,0000)***	0,7186 (0,0000)***	0,7127 (0,0000)***	0,6578 (0,0000)***
<b>Financial Debt</b>	0,1920 (0,1247)	0,2503 (0,1104)	0,4176 (0,0037)***	0,5293 (0,0005)***	0,1108 (0,4365)
<b>Company Size (Log Assets)</b>	-0,0428 (0,2416)	0,0419 (0,3363)	0,0045 (0,9163)	-0,0228 (0,6061)	-0,0216 (0,5787)
<b>Days Sales Outstanding</b>	-0,0041 (0,0000)***				-0,0040 (0,0000)***
<b>Days Inventory Outstanding</b>		0,0012 (0,0184)**			0,0006 (0,2309)
<b>Days Payable Outstanding</b>			-0,0003 (0,6404)		0,0002 (0,7433)
<b>Cash Conversion Cycle</b>				-0,0010 (0,0509)*	
Adjusted R2	0,4103	0,2194	0,1870	0,2089	0,4135
# of observations	137	137	137	137	137
#of firms	15	15	15	15	15
#of years	11	11	11	11	11

The symbols \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and %10 levels, respectively.

**Table 3.4.4 Profitability and Working Capital: Fixed Effects Regression Model**

The table represents the results of the Fixed Effects Model regression of five versions of the company profitability indicators. The sample has been covered the period starting from the year 2008 to the year 2018. The dependent variable is company profitability measured as gross operating income (GOI).

Gross operating income is (net sales-cost of goods sold + depreciation & amortisation) / (total assets-financial assets). Days sales outstanding is (average accounts receivable/sales)\*365. Days inventory outstanding is (average inventory/cost of goods sold)\*365. Days payable outstanding is (average accounts payable/cost of goods sold)\*365. The cash conversion cycle is (No. of days accounts receivable + No. of days inventories-No. of days accounts payable). Sales growth is (this year's sales-previous year's sales)/previous year's sales. Financial debt is financial debt/total assets. Company size is the logarithm of total assets.

	1	2	3	4	5
<b>Constant Coef</b>	1,3458 (0,0000)***	1,1362 (0,0000)***	1,1022 (0,0000)***	1,4090 (0,0000)***	1,4299 (0,0000)***
<b>Sales Growth</b>	0,3156 (0,0000)***	0,2913 (0,0001)***	0,3477 (0,0000)***	0,3253 (0,0000)***	0,2173 (0,0017)***
<b>Financial Debt</b>	0,5088 (0,0000)***	0,4304 (0,0001)***	0,5299 (0,0000)***	0,5800 (0,0000)***	0,3331 (0,0010)***
<b>Company Size (Log Assets)</b>	-0,2891 (0,0000)***	-0,2122 (0,0015)***	-0,2391 (0,0013)***	-0,3585 (0,0000)***	-0,2426 (0,0002)***
<b>Days Sales Outstanding</b>	-0,0048 (0,0002)***				-0,0059 (0,0000)***
<b>Days Inventory Outstanding</b>		-0,0030 (0,0000)***			-0,0044 (0,0000)***
<b>Days Payable Outstanding</b>			-0,0012 (0,0271)**		0,0017 (0,0098)***
<b>Cash Conversion Cycle</b>				-0,0027 (0,0003)***	
Adjusted R2	0,8516	0,8585	0,8400	0,8509	0,8817
# of observations	137	137	137	137	137
#of firms	15	15	15	15	15
#of years	11	11	11	11	11
Firms dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes

The symbols \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and %10 levels, respectively.

**Table 3.4.5 Profitability and Working Capital: OLS Regressions**

The table represents the results of the Ordinary Least Square Model regression of five versions of the company profitability indicators. The sample has been covered the period starting from the year 2008 to the year 2018. The dependent variable is company profitability measured as net operating income (NOI).

Net operating income is (net sales-cost of goods sold) / (total assets-financial assets). Days sales outstanding is (average accounts receivable/sales)\*365. Days inventory outstanding is (average inventory/cost of goods sold)\*365. Days payable outstanding is (average accounts payable/cost of goods sold)\*365. The cash conversion cycle is (No. of days accounts receivable + No. of days inventories-No. of days accounts payable). Sales growth is (this year's sales-previous year's sales)/previous year's sales. Financial debt is financial debt/total assets. Company size is the logarithm of total assets.

	1	2	3	4	5
<b>Constant Coef</b>	0,5705 (0,0000)***	0,1039 (0,4061)	0,2802 (0,0390)**	0,3335 (0,0064)***	0,4652 (0,0003)*
<b>Sales Growth</b>	0,6223 (0,0000)***	0,7168 (0,0000)***	0,6933 (0,0000)***	0,6884 (0,0000)***	0,6373 (0,0000)*
<b>Financial Debt</b>	0,1930 (0,1058)	0,2434 (0,1009)*	0,4017 (0,0032)***	0,5022 (0,0005)***	0,1127 (0,4066)
<b>Company Size (Log Assets)</b>	-0,0413 (0,2358)	0,0378 (0,3591)	0,0024 (0,9527)	-0,0219 (0,6009)	-0,0208 (0,5754)
<b>Days Sales Outstanding</b>	-0,0038 (0,0000)***				-0,0037 (0,0000)*
<b>Days Inventory Outstanding</b>		0,0011 (0,0183)**			0,0006 (0,2150)
<b>Days Payable Outstanding</b>			-0,0003 (0,6415)		0,0002 (0,7876)
<b>Cash Conversion Cycle</b>				-0,0009 (0,0643)*	
<b>Adjusted R2</b>	0,4048	0,2245	0,1923	0,2118	0,4080
<b># of observations</b>	137	137	137	137	137
<b>#of firms</b>	15	15	15	15	15
<b>#of years</b>	11	11	11	11	11

The symbols \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and %10 levels, respectively.

**Table 3.4.6 Profitability and Working Capital: Fixed Effects Regression Model**

The table represents the results of the Fixed Effects Model regression of five versions of the company profitability indicators. The sample has been covered the period starting from the year 2008 to the year 2018. The dependent variable is company profitability measured as net operating income (NOI).

Net operating income is (net sales-cost of goods sold) / (total assets-financial assets). Days sales outstanding is (average accounts receivable/sales)\*365. Days inventory outstanding is (average inventory/cost of goods sold)\*365. Days payable outstanding is (average accounts payable/cost of goods sold)\*365. The cash conversion cycle is (No. of days accounts receivable + No. of days inventories-No. of days accounts payable). Sales growth is (this year's sales-previous year's sales)/previous year's sales. Financial debt is financial debt/total assets. Company size is the logarithm of total assets.

	1	2	3	4	5
<b>Constant Coef</b>	1,2863 (0,0000)***	1,0855 (0,0000)***	1,0516 (0,0000)***	1,3447 (0,0000)***	1,3644 (0,0000)***
<b>Sales Growth</b>	0,3136 (0,0000)***	0,2895 (0,0001)***	0,3437 (0,0000)***	0,3233 (0,0000)***	0,2190 (0,0010)***
<b>Financial Debt</b>	0,4956 (0,0000)***	0,4189 (0,0001)***	0,5138 (0,0000)***	0,5639 (0,0000)***	0,3253 (0,0008)***
<b>Company Size (Log Assets)</b>	-0,2804 (0,0000)***	-0,2060 (0,0013)***	-0,2310 (0,0012)***	-0,3462 (0,0000)***	-0,2343 (0,0002)***
<b>Days Sales Outstanding</b>	-0,0046 (0,0002)***				-0,0056 (0,0000)***
<b>Days Inventory Outstanding</b>		-0,0029 (0,0000)***			-0,0042 (0,0000)***
<b>Days Payable Outstanding</b>			-0,0012 (0,0241)**		0,0016 (0,0112)**
<b>Cash Conversion Cycle</b>				-0,0025 (0,0003)***	
Adjusted R2	0,8484	0,8559	0,8370	0,8474	0,8791
# of observations	137	137	137	137	137
#of firms	15	15	15	15	15
#of years	11	11	11	11	11
Firms dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes

The symbols \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and %10 levels, respectively.

**Table 3.4.7 Profitability and Working Capital: OLS Regressions**

The table represents the results of the Ordinary Least Square Model regression of five versions of the company profitability indicators. The sample has been covered the period starting from the year 2008 to the year 2018. The dependent variable is company profitability measured as return on assets (ROA).

Return on assets is net income / average assets. Days sales outstanding is (average accounts receivable/sales)\*365. Days inventory outstanding is (average inventory/cost of goods sold)\*365. Days payable outstanding is (average accounts payable/cost of goods sold)\*365. The cash conversion cycle is (No. of days accounts receivable + No. of days inventories-No. of days accounts payable). Sales growth is (this year's sales-previous year's sales)/previous year's sales. Financial debt is financial debt/total assets. Company size is the logarithm of total assets.

	1	2	3	4	5
<b>Constant Coef</b>	0,0221 (0,6594)	0,0206 (0,6868)	0,0968 (0,0644)*	-0,0167 (0,7318)	0,0835 (0,1446)
<b>Sales Growth</b>	-0,1201 (0,0452)*	-0,1177 (0,0491)*	-0,1339 (0,0211)**	-0,1130 (0,0581)*	-0,1330 (0,0229)**
<b>Financial Debt</b>	-0,0944 (0,0898)*	-0,0630 (0,2972)	-0,0953 (0,0672)*	-0,1047 (0,0691)*	-0,1233 (0,0465)*
<b>Company Size (Log Assets)</b>	0,0158 (0,3302)	0,0146 (0,3854)	0,0097 (0,5351)	0,0249 (0,1440)	0,0144 (0,3932)
<b>Days Sales Outstanding</b>	-0,0002 (0,4074)				0,00005 (0,8663)
<b>Days Inventory Outstanding</b>		-0,0001 (0,4884)			0,0002 (0,3775)
<b>Days Payable Outstanding</b>			-0,0008 (0,0015)***		-0,0009 (0,0022)**
<b>Cash Conversion Cycle</b>				0,0002 (0,2850)	
Adjusted R2	0,0219	0,0204	0,0893	0,0253	0,0809
# of observations	137	137	137	137	137
#of firms	15	15	15	15	15
#of years	11	11	11	11	11

The symbols \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and %10 levels, respectively.

**Table 3.4.8 Profitability and Working Capital: Fixed Effects Regression Model**

The table represents the results of the Fixed Effects Model regression of five versions of the company profitability indicators. The sample has been covered the period starting from the year 2008 to the year 2018. The dependent variable is company profitability measured as return on assets (ROA).

Return on assets is net income / average assets. Days sales outstanding is (average accounts receivable/sales)\*365. Days inventory outstanding is (average inventory/cost of goods sold)\*365. Days payable outstanding is (average accounts payable/cost of goods sold)\*365. The cash conversion cycle is (No. of days accounts receivable + No. of days inventories-No. of days accounts payable). Sales growth is (this year's sales-previous year's sales)/previous year's sales. Financial debt is financial debt/total assets. Company size is the logarithm of total assets.

	1	2	3	4	5
<b>Constant Coef</b>	0,2268 (0,1425)	0,1173 (0,4135)	0,0526 (0,7220)	0,1817 (0,2597)	0,1738 (0,2510)
<b>Sales Growth</b>	-0,1857 (0,0022)***	-0,2175 (0,0002)***	-0,1901 (0,0011)***	-0,1653 (0,0069)***	-0,2417 (0,0001)***
<b>Financial Debt</b>	-0,1253 (0,1352)	-0,2077 (0,0136)**	-0,1794 (0,0323)**	-0,0805 (0,3286)	-0,2576 (0,0028)***
<b>Company Size (Log Assets)</b>	-0,0234 (0,6538)	0,0354 (0,4972)	0,0492 (0,3720)	-0,0381 (0,4840)	0,0491 (0,3596)
<b>Days Sales Outstanding</b>	-0,0022 (0,0296)**				-0,0021 (0,0473)**
<b>Days Inventory Outstanding</b>		-0,0021 (0,0001)***			-0,0019 (0,0071)***
<b>Days Payable Outstanding</b>			-0,0015 (0,0005)***		-0,0003 (0,6425)
<b>Cash Conversion Cycle</b>				-0,0004 (0,5277)	
Adjusted R2	0,1760	0,2508	0,2273	0,1451	0,2730
# of observations	137	137	137	137	137
#of firms	15	15	15	15	15
#of years	11	11	11	11	11
Firms dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes

The symbols \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and %10 levels, respectively.

Table 3.4.9 Formulas

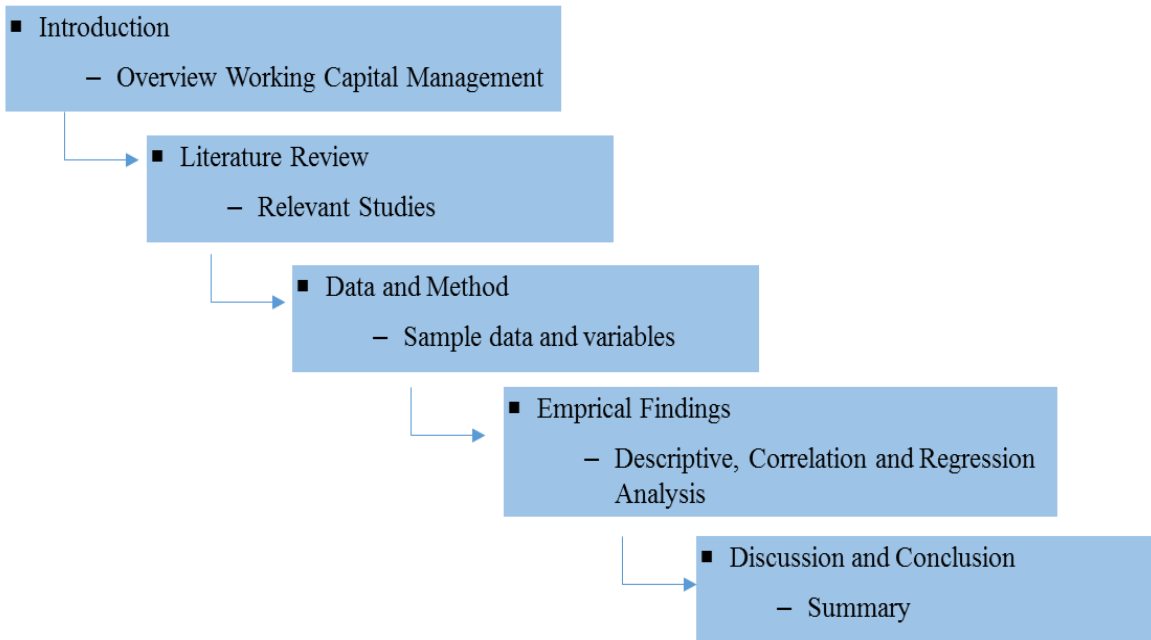
Abbreviation	Dependent variables	Formula
GOI	Gross Operating Income	$(\text{Net Sales} - \text{Cost of Goods Sold} + \text{Depreciation} \& \text{Amortisation}) / (\text{Total Assets} - \text{Financial Assets})$
NOI	Net Operating Income	$(\text{Net Sales} - \text{Cost of Goods Sold}) / (\text{Total Assets} - \text{Financial Assets})$
ROA	Return on Assets	$\text{Net Income} / \text{Average Assets}$
Abbreviation	Independent variables	Formula
DSO	Days Sales Outstanding	$(\text{Average Accounts Receivable} / \text{Sales}) * 365$
DIO	Days Inventory Outstanding	$(\text{Average Inventory} / \text{Cost of Goods Sold}) * 365$
DPO	Days Payable Outstanding	$(\text{Average Accounts Payable} / \text{Cost of Goods Sold}) * 365$
CCC	Cash Conversion Cycle (CCC)	$\text{Accounts Receivable Period} + \text{Inventory Period} - \text{Accounts Payable Period}$
Abbreviation	Control variables	Formula
SG	Sales Growth	$[(\text{Sales } t - \text{Sales } t - 1) / \text{Sales } t - 1]$
FD	Financial Debt	$\text{Financial Debt} / \text{Total Assets}$
CS	Company Size	$\text{Log Assets}$

**Table 3.4.10 Thesis Structure**

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**Thesis Structure**

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**Table 3.4.11 Data and Method Structure**

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**Data and Method Structure**

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